

W. H. CHARLES ALBERT

THE AMERICAN NAUTICAL ALMANAC

FOR THE YEAR
1955



UNITED STATES NAVAL OBSERVATORY
WASHINGTON
D. C.

STARS

CORRECTIONS TO OBSERVED ALTITUDES

NAME	MAG. NO.	STARS AND PLANETS		SUN'S LOWER LIMB		HEIGHT OF EYE	
		Obs. Alt. corr'n	Obs. Alt. corr'n	Obs. Alt. corr'n	Obs. Alt. corr'n	Feet corr'n	Feet corr'n
Acamar	3.1 7						
Achernar	0.6 5						
Acrux	1.1 30						
Adhara	1.6 19						
Aldebaran	1.1 10	4 23 -10.9	9 44 -5.4	4 22 + 4.9	9 39 +10.4	1.0 -1.0	46 - 6.5
		4 26 -10.8	9 56 -5.3	4 25 + 5.0	9 51 +10.5	1.2 -1.1	47 - 6.6
Alioth	1.7 32	4 29 -10.7	10 08 -5.2	4 28 + 5.1	10 03 +10.6	1.4 -1.2	49 - 6.7
Alkaid	1.9 34	4 32 -10.6	10 20 -5.1	4 31 + 5.2	10 15 +10.7	1.7 -1.3	50 - 6.8
Al Na'ir	2.2 55	4 36 -10.5	10 33 -5.0	4 34 + 5.3	10 27 +10.8	2.0 -1.4	52 - 6.9
Alnilam	1.8 15	4 39 -10.4	10 46 -4.9	4 37 + 5.4	10 40 +10.9	2.3 -1.5	53 - 7.0
Alphard	2.2 25	4 42 -10.3	11 00 -4.8	4 41 + 5.5	10 54 +11.0	2.6 -1.6	55 - 7.1
		4 46 -10.2	11 14 -4.7	4 44 + 5.6	11 08 +11.1	3.0 -1.7	56 - 7.2
Alphecca	2.3 41	4 49 -10.1	11 29 -4.6	4 48 + 5.7	11 23 +11.2	3.4 -1.8	58 - 7.3
Alpheratz	2.2 1	4 53 -10.0	11 45 -4.5	4 51 + 5.8	11 38 +11.3	3.8 -1.9	60 - 7.4
Altair	0.9 51	4 56 -9.9	12 01 -4.4	4 55 + 5.9	11 54 +11.4	4.2 -2.0	61 - 7.5
Ankaa	2.4 2	5 00 -9.8	12 18 -4.3	4 58 + 6.0	12 10 +11.5	4.6 -2.1	63 - 7.6
Antares	1.2 42	5 04 -9.7	12 35 -4.2	5 02 + 6.1	12 28 +11.6	5.1 -2.2	65 - 7.7
		5 08 -9.6	12 54 -4.1	5 06 + 6.2	12 46 +11.7	5.5 -2.3	66 - 7.8
Arcturus	0.2 37	5 12 -9.5	13 13 -4.0	5 10 + 6.3	13 05 +11.8	6.1 -2.4	68 - 7.9
Atria	1.9 43	5 16 -9.4	13 33 -3.9	5 14 + 6.4	13 24 +11.9	6.6 -2.5	70 - 8.0
Avior	1.7 22	5 20 -9.3	13 54 -3.8	5 18 + 6.5	13 45 +12.0	7.2 -2.6	72 - 8.1
Bellatrix	1.7 13	5 24 -9.2	14 16 -3.7	5 22 + 6.6	14 07 +12.1	7.8 -2.7	74 - 8.2
Betelgeuse	0.1 to 1.2 16	5 28 -9.1	14 40 -3.6	5 26 + 6.7	14 30 +12.2	8.4 -2.8	75 - 8.3
		5 32 -9.0	15 04 -3.5	5 31 + 6.8	14 54 +12.3	9.0 -2.9	77 - 8.4
Canopus	-0.9 17	5 37 -8.9	15 30 -3.4	5 35 + 6.9	15 19 +12.4	9.6 -3.0	79 - 8.5
Capella	0.2 12	5 41 -8.8	15 57 -3.3	5 39 + 7.0	15 46 +12.5	10.3 -3.1	81 - 8.6
Deneb	1.3 53	5 46 -8.7	16 26 -3.2	5 44 + 7.1	16 14 +12.6	11.0 -3.2	83 - 8.7
Denebola	2.2 28	5 51 -8.6	16 56 -3.1	5 49 + 7.2	16 44 +12.7	11.7 -3.3	85 - 8.8
Diphda	2.2 4	5 55 -8.5	17 28 -3.0	5 53 + 7.3	17 15 +12.8	12.4 -3.4	87 - 8.9
		6 00 -8.4	18 02 -2.9	5 58 + 7.4	17 48 +12.9	13.2 -3.5	89 - 9.0
Dubhe	2.0 27	6 05 -8.3	18 38 -2.8	6 03 + 7.5	18 24 +13.0	14.0 -3.6	91 - 9.1
Elnath	1.8 14	6 11 -8.2	19 17 -2.7	6 08 + 7.6	19 01 +13.1	14.8 -3.7	93 - 9.2
Eltanin	2.4 47	6 16 -8.1	19 58 -2.6	6 13 + 7.7	19 42 +13.2	15.6 -3.8	95 - 9.3
Enif	2.5 54	6 21 -8.0	20 42 -2.5	6 19 + 7.8	20 25 +13.3	16.4 -3.9	97 - 9.4
Fomalhaut	1.3 56	6 27 -7.9	21 28 -2.4	6 24 + 7.9	21 11 +13.4	17.3 -4.0	99 - 9.5
		6 32 -7.8	22 19 -2.3	6 30 + 8.0	22 00 +13.5	18.2 -4.1	101 - 9.6
Gacrux	1.6 31	6 38 -7.7	23 13 -2.2	6 35 + 8.1	22 54 +13.6	19.1 -4.2	103 - 9.7
Gienah	2.8 29	6 44 -7.6	24 11 -2.1	6 41 + 8.2	23 51 +13.7	20.0 -4.3	105 - 9.8
Hadar	0.9 35	6 50 -7.5	25 14 -2.0	6 47 + 8.3	24 53 +13.8	21 -4.4	107 - 9.9
Hamal	2.2 6	6 56 -7.4	26 22 -1.9	6 53 + 8.4	26 00 +13.9	22 -4.5	110 - 10.0
Kaus Australis	2.0 48	7 03 -7.3	27 36 -1.8	7 00 + 8.5	27 13 +14.0	23 -4.6	112 - 10.1
		7 09 -7.2	28 56 -1.7	7 06 + 8.6	28 33 +14.1	24 -4.7	114 - 10.2
Kochab	2.2 40	7 16 -7.1	30 24 -1.6	7 13 + 8.7	30 00 +14.2	25 -4.8	116 - 10.3
Markab	2.6 57	7 23 -7.0	32 00 -1.5	7 19 + 8.8	31 35 +14.3	26 -4.9	119 - 10.4
Menkar	2.8 8	7 30 -6.9	33 45 -1.4	7 26 + 8.9	33 20 +14.4	27 -5.0	121 - 10.5
Menkent	2.3 36	7 37 -6.8	35 40 -1.3	7 34 + 9.0	35 17 +14.5	28 -5.1	123 - 10.6
Miaplacidus	1.8 24	7 44 -6.7	37 48 -1.2	7 41 + 9.1	37 26 +14.6	29 -5.2	126 - 10.7
		7 52 -6.6	40 08 -1.1	7 49 + 9.2	39 50 +14.7	30 -5.3	128 - 10.8
Mirfak	1.9 9	8 00 -6.5	42 44 -1.0	7 56 + 9.3	42 31 +14.8	31 -5.4	130 - 10.9
Nunki	2.1 50	8 08 -6.4	45 36 -0.9	8 04 + 9.4	45 31 +14.9	33 -5.5	133 - 11.0
Peacock	2.1 52	8 16 -6.3	48 47 -0.8	8 13 + 9.5	48 55 +15.0	34 -5.6	135 - 11.1
Pollux	1.2 21	8 25 -6.2	52 18 -0.7	8 21 + 9.6	52 44 +15.1	35 -5.7	138 - 11.2
Procyon	0.5 20	8 34 -6.1	56 11 -0.6	8 30 + 9.7	57 02 +15.2	36 -5.8	140 - 11.3
		8 43 -6.0	60 28 -0.5	8 39 + 9.8	61 51 +15.3	38 -5.9	143 - 11.4
Rasalhague	2.1 46	8 52 -5.9	65 08 -0.4	8 48 + 9.9	67 17 +15.4	39 -6.0	145 - 11.5
Regulus	1.3 26	9 02 -5.8	70 11 -0.3	8 58 + 10.0	73 16 +15.5	40 -6.1	148 - 11.6
Rigel	0.3 11	9 12 -5.7	75 34 -0.2	9 08 + 10.1	79 43 +15.6	42 -6.2	150 - 11.7
Rigel Kentaurus	0.1 38	9 23 -5.6	81 13 -0.1	9 18 + 10.2	86 32 +15.7	43 -6.3	153 - 11.8
Sabik	2.6 44	9 33 -5.5	87 03 0.0	9 28 + 10.3	90 00 +15.7	44 -6.4	156 - 11.9
		9 44 -5.4	90 00 0.0	9 39 + 10.4		46 -6.5	158 - 12.0
Schedar	2.5 3						
Shaula	1.7 45						
Sirius	-1.6 18						
Spica	1.2 33						
Suhail	2.2 23						
Vega	0.1 49						
Zubenelgenubi	2.9 39						

When an observed altitude, or the height of eye, corresponds exactly to a printed value, use the upper of the two possible corrections. For Venus, Mars, and the Sun's lower limb, apply also the additional corrections on the daily pages. For the Moon, see back cover. For the Sun's upper limb, and bubble sextant observations, see page 250.



THE AMERICAN NAUTICAL ALMANAC

FOR THE YEAR

1955

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APRIL 1953.

PREFACE

This volume of the *American Nautical Almanac* was prepared under the immediate supervision of G. M. CLEMENCE and R. L. DUNCOMBE. The nature and arrangement of the material are the same as in the volume for 1954.

The object of the volume is to provide in convenient form the astronomical data required by mariners; that is, the Greenwich hour angle and declination of the celestial bodies used in navigation. These can always be found with two openings of the book, one (in the white section) for the hour and the other (in the yellow section) for the minute of observation. Each result is obtained as the sum of two or of three quantities, without interpolation.

The altitude corrections are obtained without interpolation; and the parallax and semidiameter of the Moon are not needed.

An explanation of the use of the *Almanac* is given near the end of the white section. This is followed by a supplementary list of 172 stars and tables for finding the latitude by Polaris.

F. A. GRAF,
Captain, U. S. Navy,
Superintendent Naval Observatory.

WASHINGTON, April 1953.

G M T	VENUS - 4.3		MARS 0.9		JUPITER - 2.2		SATURN 0.8		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
h	°	'	°	'	°	'	°	'	°	'	°	'
10	99 52.3	225 24.1 -15 24.3	108 59.7 - 4 35.9	340 54.3 +21 09.7	233 21.6 -15 10.7	102 58.7 122 + 4 23.1 +139						
1	114 54.8	240 24.7 24.7	124 00.5 35.1	355 57.0 09.8	248 23.9 10.8	117 29.9 123 + 4 37.0 +139						
2	129 57.3	255 25.2 25.1	139 01.3 34.4	10 59.8 09.9	263 26.1 10.8	132 01.2 122 + 4 50.9 +139						
3	144 59.7	270 25.8 .. 25.4	154 02.2 .. 33.6	26 02.6 .. 09.9	278 28.4 .. 10.9	146 32.4 121 + 5 04.8 +138						
4	160 02.2	285 26.4 25.8	169 03.0 32.9	41 05.4 10.0	293 30.6 10.9	161 03.5 121 + 5 18.6 +139						
5	175 04.6	300 26.9 26.1	184 03.8 32.1	56 08.2 10.1	308 32.8 11.0	175 34.6 121 + 5 32.5 +138						
6	190 07.1	315 27.5 -15 26.5	199 04.7 - 4 31.3	71 11.0 +21 10.1	323 35.1 -15 11.0	190 05.7 120 + 5 46.3 +138						
7	205 09.6	330 28.0 26.9	214 05.5 30.6	86 13.8 10.2	338 37.3 11.1	204 36.7 119 + 6 00.1 +138						
8	220 12.0	345 28.6 27.2	229 06.3 29.8	101 16.6 10.3	353 39.6 11.2	219 07.6 119 + 6 13.9 +138						
9	235 14.5	0 29.1 .. 27.6	244 07.1 .. 29.1	116 19.4 .. 10.3	8 41.8 .. 11.2	233 38.5 118 + 6 27.7 +137						
10	250 17.0	15 29.7 28.0	259 08.0 28.3	131 22.1 10.4	23 44.1 11.3	248 09.3 118 + 6 41.5 +137						
11	265 19.4	30 30.2 28.3	274 08.8 27.6	146 24.9 10.5	38 46.3 11.3	262 40.1 117 + 6 55.2 +137						
12	280 21.9	45 30.8 -15 28.7	289 09.6 - 4 26.8	161 27.7 +21 10.5	53 48.5 -15 11.4	277 10.8 117 + 7 08.9 +137						
13	295 24.4	60 31.3 29.1	304 10.4 26.1	176 30.5 10.6	68 50.8 11.4	291 41.5 116 + 7 22.6 +137						
14	310 26.8	75 31.9 29.4	319 11.3 25.3	191 33.3 10.7	83 53.0 11.5	306 12.1 115 + 7 36.3 +136						
15	325 29.3	90 32.4 .. 29.8	334 12.1 .. 24.6	206 36.1 .. 10.7	98 55.3 .. 11.5	320 42.6 115 + 7 49.9 +136						
16	340 31.7	105 33.0 30.2	349 12.9 23.8	221 38.9 10.8	113 57.5 11.6	335 13.1 114 + 8 03.5 +136						
17	355 34.2	120 33.5 30.5	4 13.8 23.0	236 41.7 10.9	128 59.8 11.7	349 43.5 113 + 8 17.1 +135						
18	10 36.7	135 34.0 -15 30.9	19 14.6 - 4 22.3	251 44.5 +21 10.9	144 02.0 -15 11.7	4 13.8 113 + 8 30.6 +136						
19	25 39.1	150 34.6 31.3	34 15.4 21.5	266 47.3 11.0	159 04.2 11.8	18 44.1 112 + 8 44.2 +134						
20	40 41.6	165 35.1 31.6	49 16.2 20.8	281 50.1 11.1	174 06.5 11.8	33 14.3 112 + 8 57.6 +135						
21	55 44.1	180 35.6 .. 32.0	64 17.1 .. 20.0	296 52.8 .. 11.1	189 08.7 .. 11.9	47 44.5 111 + 9 11.1 +134						
22	70 46.5	195 36.2 32.4	79 17.9 19.3	311 55.6 11.2	204 11.0 11.9	62 14.6 110 + 9 24.5 +134						
23	85 49.0	210 36.7 32.7	94 18.7 18.5	326 58.4 11.3	219 13.2 12.0	76 44.6 109 + 9 37.9 +133						
20	100 51.5	225 37.2 -15 33.1	109 19.6 - 4 17.8	342 01.2 +21 11.3	234 15.5 -15 12.0	91 14.5 109 + 9 51.2 +133						
1	115 53.9	240 37.7 33.5	124 20.4 17.0	357 04.0 11.4	249 17.7 12.1	105 44.4 108 + 10 04.5 +132						
2	130 56.4	255 38.3 33.8	139 21.2 16.3	12 06.8 11.5	264 19.9 12.1	120 14.2 107 + 10 17.7 +132						
3	145 58.9	270 38.8 .. 34.2	154 22.0 .. 15.5	27 09.6 .. 11.5	279 22.2 .. 12.2	134 43.9 107 + 10 30.9 +132						
4	161 01.3	285 39.3 34.6	169 22.9 14.7	42 12.4 11.6	294 24.4 12.2	149 13.6 105 + 10 44.1 +131						
5	176 03.8	300 39.8 35.0	184 23.7 14.0	57 15.2 11.7	309 26.7 12.3	163 43.1 105 + 10 57.2 +131						
6	191 06.2	315 40.3 -15 35.3	199 24.5 - 4 13.2	72 18.0 +21 11.7	324 28.9 -15 12.4	178 12.6 105 +11 10.3 +130						
7	206 08.7	330 40.9 35.7	214 25.3 12.5	87 20.8 11.8	339 31.2 12.4	192 42.1 103 + 11 23.3 +130						
8	221 11.2	345 41.4 36.1	229 26.2 11.7	102 23.6 11.9	354 33.4 12.5	207 11.4 103 + 11 36.3 +129						
9	236 13.6	0 41.9 .. 36.5	244 27.0 .. 11.0	117 26.4 .. 11.9	9 35.6 .. 12.5	221 40.7 102 + 11 49.2 +128						
10	251 16.1	15 42.4 36.8	259 27.8 10.2	132 29.2 12.0	24 37.9 12.6	236 09.9 101 + 12 02.0 +128						
11	266 18.6	30 42.9 37.2	274 28.7 09.5	147 31.9 12.1	39 40.1 12.6	250 39.0 100 + 12 14.9 +127						
12	281 21.0	45 43.4 -15 37.6	289 29.5 - 4 08.7	162 34.7 +21 12.1	54 42.4 -15 12.7	265 08.0 99 +12 27.6 +127						
13	296 23.5	60 43.9 38.0	304 30.3 08.0	177 37.5 12.2	69 44.6 12.7	279 36.9 99 + 12 40.3 +126						
14	311 26.0	75 44.4 38.3	319 31.2 07.2	192 40.3 12.3	84 46.9 12.8	294 05.8 97 + 12 52.9 +126						
15	326 28.4	90 44.9 .. 38.7	334 32.0 .. 06.4	207 43.1 .. 12.3	99 49.1 .. 12.8	308 34.5 97 + 13 05.5 +125						
16	341 30.9	105 45.4 39.1	349 32.8 05.7	222 45.9 12.4	114 51.4 12.9	323 03.2 96 + 13 18.0 +125						
17	356 33.4	120 45.9 39.5	4 33.6 04.9	237 48.7 12.5	129 53.6 13.0	337 31.8 95 + 13 30.5 +123						
18	11 35.8	135 46.4 -15 39.8	19 34.5 - 4 04.2	252 51.5 +21 12.5	144 55.8 -15 13.0	352 00.3 94 +13 42.8 +123						
19	26 38.3	150 46.9 40.2	34 35.3 03.4	267 54.3 12.6	159 58.1 13.1	6 28.7 94 + 13 55.1 +123						
20	41 40.7	165 47.4 40.6	49 36.1 02.7	282 57.1 12.7	175 00.3 13.1	20 57.1 92 + 14 07.4 +122						
21	56 43.2	180 47.9 .. 41.0	64 37.0 .. 01.9	297 59.9 .. 12.7	190 02.6 .. 13.2	35 25.3 92 + 14 19.6 +121						
22	71 45.7	195 48.4 41.4	79 37.8 01.2	313 02.7 12.8	205 04.8 13.2	49 53.5 90 + 14 31.7 +120						
23	86 48.1	210 48.9 41.7	94 38.6 4 00.4	328 05.5 12.9	220 07.1 13.3	64 21.5 90 + 14 43.7 +119						
30	101 50.6	225 49.3 -15 42.1	109 39.4 - 3 59.6	343 08.3 +21 12.9	235 09.3 -15 13.3	78 49.5 89 +14 55.6 +119						
1	116 53.1	240 49.8 42.5	124 40.3 58.9	358 11.1 13.0	250 11.6 13.4	93 17.4 88 + 15 07.5 +118						
2	131 55.5	255 50.3 42.9	139 41.1 58.1	13 13.9 13.1	265 13.8 13.4	107 45.2 87 + 15 19.3 +117						
3	146 58.0	270 50.8 .. 43.3	154 41.9 .. 57.4	28 16.7 .. 13.1	280 16.1 .. 13.5	122 12.9 86 + 15 31.0 +117						
4	162 00.5	285 51.3 43.7	169 42.8 56.6	43 19.5 13.2	295 18.3 13.5	136 40.5 85 + 15 42.7 +115						
5	177 02.9	300 51.7 44.0	184 43.6 55.9	58 22.3 13.3	310 20.6 13.6	151 08.0 84 + 15 54.2 +115						
6	192 05.4	315 52.2 -15 44.4	199 44.4 - 3 55.1	73 25.1 +21 13.3	325 22.8 -15 13.6	165 35.4 83 +16 05.7 +114						
7	207 07.8	330 52.7 44.8	214 45.2 54.4	88 27.9 13.4	340 25.0 13.7	180 02.7 82 + 16 17.1 +113						
8	222 10.3	345 53.2 45.2	229 46.1 53.6	103 30.7 13.5	355 27.3 13.8	194 29.9 82 + 16 28.4 +112						
9	237 12.8	0 53.6 .. 45.6	244 46.9 .. 52.8	118 33.5 .. 13.5	10 29.5 .. 13.8	208 57.1 80 + 16 39.6 +111						
10	252 15.2	15 54.1 46.0	259 47.7 52.1	133 36.2 13.6	25 31.8 13.9	223 24.1 79 + 16 50.7 +110						
11	267 17.7	30 54.6 46.3	274 48.6 51.3	148 39.0 13.7	40 34.0 13.9	237 51.0 79 + 17 01.7 +109						
12	282 20.2	45 55.0 -15 46.7	289 49.4 - 3 50.6	163 41.8 +21 13.7	55 36.3 -15 14.0	252 17.9 77 +17 12.6 +108						
13	297 22.6	60 55.5 47.1	304 50.2 49.8	178 44.6 13.8	70 38.5 14.0	266 44.6 77 + 17 23.4 +108						
14	312 25.1	75 56.0 47.5	319 51.1 49.1	193 47.4 13.9	85 40.8 14.1	281 11.3 75 + 17 34.2 +106						
15	327 27.6	90 56.4 .. 47.9	334 51.9 .. 48.3	208 50.2 .. 13.9	100 43.0 .. 14.1	295 37.8 74 + 17 44.8 +105						
16	342 30.0	105 56.9 48.3	349 52.7 47.6	223 53.0 14.0	115 45.3 14.2	310 04.2 74 + 17 55.3 +105						
17	357 32.5	120 57.3 48.7	4 53.5 46.8	238 55.8 14.1	130 47.5 14.2	324 30.6 72 + 18 05.8 +103						
18	12 35.0	135 57.8 -15 49.0	19 54.4 - 3 46.0	253 58.6 +21 14.1	145 49.8 -15 14.3	338 56.8 72 +18 16.1 +102						
19	27 37.4	150 58.3 49.4	34 55.2 45.3	269 01.4 14.2	160 52.0 14.3	353 23.0 70 + 18 26.3 +101						
20	42 39.9	165 58.7 49.8	49 56.0 44.5	284 04.2 14.3	175 54.3 14.4	7 49.0 70 + 18 36.4 +100						
21	57 42.3	180 59.2 .. 50.2	64 56.9 .. 43.8	299 07.0 .. 14.3	190 56.5 .. 14.4	22 15.0 69 + 18 46.4 + 99						
22	72 44.8	195 59.6 50.6	79 57.7 43.0	314 09.8 14.4	205 58.8 14.5	36 40.9 67 + 18 56.3 + 98						
23	87 47.3	211 00.1 51.0	94 58.5 42.3	329 12.6 14.5	221 01.0 14.5	51 06.6 67 + 19 06.1 + 96						
24	102 49.7	226 00.5 -15 51.4	109 59.4 - 3 41.5	344 15.4 +21 14.5	236 03.3 -15 14.6	65 32.3 66 +19 15.7 + 96						
code	-	+ 5 - 4	+ 8 + 7	+ 28 + 1	+ 22 0							

G M T	SUN			STARS			Lat.	Sunrise	Twit. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS						
	GHA	Dec.	No.	Name	SHA	Dec.				1	2	3	4	Alt.	Sun's Low'r Limb	Venus	Mars			
h	°	'	°	°	'	°	N	h	m	h	m	h	m	h	m	°	'	°	'	
1	179	12.9	-23	05.0	7	Acamar	315 51.2	-40 29.2	72	6 55	10 04	9 34	8 42	□	Alt.					
2	194	12.6	04.8		5	Achernar	335 59.0	-57 28.1	70	6 46	10 13	9 54	9 26	□						
3	209	12.3	04.6		30	Acruz	173 58.4	-62 50.8	68	6 39	10 21	10 10	9 55	9 28						
4	224	12.0	04.4		19	Adhara	255 46.6	-28 54.6	66	6 33	10 27	10 23	10 17	10 11						
5	239	11.7	04.3		10	Aldebaran	291 39.4	+16 25.3	64	6 27	10 33	10 33	10 35	10 40						
6	254	11.4	04.1						62	6 23	10 38	10 42	10 50	11 02						
7	269	11.1	-23	03.9	32	Alioth	166 59.0	+56 11.8	60	6 18	10 42	10 50	11 02	11 20						
8	284	10.8	03.7		34	Alkaid	153 33.4	+49 31.9	58	6 14	10 45	10 57	11 13	11 35						
9	299	10.5	03.5		55	Al Na'ir	28 38.9	-47 10.9	56	6 11	10 49	11 04	11 22	11 48						
10	314	10.2	03.3		15	Alnilam	276 30.5	-1 13.8	54	6 06	10 52	11 09	11 31	11 59						
11	329	09.9	03.1		25	Alphard	218 38.8	-8 27.8	52	6 03	10 54	11 14	11 38	12 09						
12	344	09.6	02.9						50	6 00	10 57	11 19	11 45	12 18						
13	359	09.3	-23	02.7	41	Alphecca	126 48.3	+26 51.7	45	5 52	11 02	11 29	12 00	12 38						
14	14	09.0	02.5		1	Alpheratz	358 29.0	+28 50.8	40	5 45	11 07	11 37	12 12	12 53						
15	29	08.7	02.3		51	Altair	62 51.3	+8 44.9	35	5 37	11 11	11 44	12 22	13 06						
16	44	08.4	02.1		2	Ankaa	353 58.8	-42 33.1	30	5 31	11 14	11 51	12 31	13 18						
17	59	08.1	01.9		42	Antares	113 20.3	-26 20.0	20	5 17	11 20	12 02	12 47	13 38						
18	74	07.8	01.7						10	5 02	11 26	12 12	13 01	13 55						
19	89	07.5	-23	01.5	37	Arcturus	146 35.8	+19 24.7	0	4 45	11 31	12 21	13 14	14 12						
20	104	07.2	01.3		43	Atria	109 02.1	-68 56.8	10	4 25	11 36	12 30	13 27	14 28						
21	119	06.9	01.1		22	Avior	234 35.4	-59 21.8	20	4 00	11 42	12 40	13 42	14 46						
22	134	06.6	00.9		13	Bellatrix	279 18.7	+6 18.6	30	5 03	11 48	12 52	13 58	15 07						
23	149	06.3	00.7		16	Betelge'se	271 48.4	+7 24.0	35	4 50	11 52	12 59	14 08	15 19						
	164	06.0	00.5						40	4 35	12 02	13 06	14 19	15 32						
					17	Canopus	264 15.0	-52 40.3	45	4 18	12 07	13 15	14 32	15 49						
2	179	05.7	-23	00.3	12	Capella	281 38.7	+45 57.4	50	3 56	12 07	13 26	14 48	16 09						
1	194	05.4	23	00.1	53	Deneb	50 01.8	+45 07.3	52	3 45	12 10	13 31	14 55	16 19						
2	209	05.2	22	59.9	28	Denebola	183 18.2	+14 49.2	54	3 33	12 13	13 37	15 04	16 30						
3	224	04.9	59.7		4	Diphda	349 39.8	-18 14.0	56	3 19	12 16	13 43	15 13	16 43						
4	239	04.6	59.4						58	3 03	12 20	13 50	15 24	16 57						
5	254	04.3	59.2		27	Dubhe	194 44.8	+61 59.3	60	2 43	12 24	13 58	15 36	17 15						
6	269	04.0	-22	59.0	14	Elnath	279 07.6	+28 34.3	S											
7	284	03.7	58.8		47	Eltanin	91 07.0	+51 29.5												
8	299	03.4	58.6		54	Enif	34 30.4	+9 40.2												
9	314	03.1	58.4		56	Fomalhaut	16 12.4	-29 51.7												
10	329	02.8	58.2						N											
11	344	02.5	58.0		31	Gacrux	172 49.8	-56 51.5	72	17 13	0 01	2 14	4 56	□						
12	359	02.2	-22	57.7	29	Gienah	176 37.4	-17 17.6	70	17 21	25 57	1 57	4 14	□						
13	14	01.9	57.5		35	Hadar	149 50.4	-60 09.3	68	17 28	25 43	1 43	3 46	6 11						
14	29	01.6	57.3		6	Hamal	328 50.1	+23 15.2	66	13 41	17 35	25 32	1 32	5 29						
15	44	01.3	57.1		48	Kaus Aust.	84 42.3	-34 24.5	64	14 19	17 41	25 23	1 23	5 09						
16	59	01.0	56.9						62	14 45	17 45	25 15	1 15	4 39						
17	74	00.7	56.6		40	Kochab	137 18.5	+74 20.0	60	15 06	17 50	25 08	1 08	4 22						
18	89	00.5	-22	56.4	57	Markab	14 22.1	+14 57.9	58	15 22	17 53	25 02	1 02	4 08						
19	104	00.2	56.2		8	Menkar	315 00.7	+3 54.9	56	15 37	17 58	24 57	0 57	3 55						
20	118	59.9	56.0		36	Menkent	148 59.5	-36 08.9	54	15 49	18 01	24 52	0 52	3 44						
21	133	59.6	55.8		24	Miap'l'dus	221 48.4	-69 31.8	52	16 00	18 05	24 48	0 48	3 35						
22	148	59.3	55.5						50	16 09	18 08	24 44	0 44	3 26						
23	163	59.0	55.3		9	Mirfak	309 42.8	+49 42.4	45	16 29	18 15	24 36	0 36	3 08						
					50	Nunki	76 52.9	-26 21.3	40	16 46	18 23	24 29	0 29	2 54						
3	178	58.7	-22	55.1	52	Peacock	54 28.6	-56 52.9	35	17 00	18 30	24 23	0 23	2 41						
1	193	58.4	54.9		21	Pollux	244 20.8	+28 08.1	30	17 12	18 37	24 18	0 18	2 30						
2	208	58.1	54.6		20	Procyon	245 45.2	+5 20.4	20	17 32	18 50	24 09	0 09	2 12						
3	223	57.8	54.4						10	17 51	19 06	24 02	0 02	1 56						
4	238	57.5	54.2		46	R'alhague	96 47.4	+12 35.4	0	18 08	19 23	23 54	24 46	0 46						
5	253	57.2	54.0		26	Regulus	208 29.8	+12 11.1	10	18 25	19 42	23 47	24 34	0 34						
6	268	57.0	-22	53.7	11	Rigel	281 53.8	-8 15.1	20	18 43	20 07	23 39	24 22	0 22						
7	283	56.7	53.5		38	Rigil Kent.	140 52.0	-60 38.9	30	19 05	20 41	23 30	24 09	0 09						
8	298	56.4	53.3		44	Sabik	103 03.1	-15 40.3	35	19 17	21 03	23 25	24 01	0 01						
9	313	56.1	53.0						40	19 32	21 34	23 20	23 52	24 30						
10	328	55.8	52.8		3	Schedar	350 30.6	+56 17.8	45	19 50	22 20	23 13	23 42	24 15						
11	343	55.5	52.6		45	Shaula	97 21.8	-37 04.4	50	20 11	22 03	23 05	23 29	23 58						
12	358	55.2	-22	52.3	18	Sirius	259 12.0	-16 39.2	52	20 22	22 03	23 02	23 23	23 50						
13	13	54.9	52.1		33	Spica	159 17.5	-10 55.7	54	20 34	22 03	22 58	23 17	23 41						
14	28	54.6	51.9		23	Suhail	223 24.4	-43 15.0	56	20 48	22 03	23 10	23 31	24 02						
15	43	54.4	51.6						58	21 04	22 03	23 02	23 20	23 47						
16	58	54.1	51.4		49	Vega	81 09.1	+38 44.4	60	21 23	22 03	23 02	23 07	23 29						
17	73	53.8	51.1		39	Zub'g'bi	137 54.1	-15 51.4	S											
18	88	53.5	-22	50.9																
19	103	53.2	50.7		G	Equation of Time (App.—Mean)			GMT of Transit											
20	118	52.9	50.4		T				Meridian of Greenwich											
21	133	52.6	50.2			h	m	s	m	s	m	s	DAY	Moon	Venus	Mars	Jupiter	Saturn		
22	148	52.3	49.9			0	-	3 07.9	-	3 36.5	-	4 04.6	1	17 43	8 58	16 43	1 16	8 25		
23	163	52.0	49.7			6	-	3 15.1	-	3 43.5	-	4 11.6	2	18 33	8 57	16 42	1 12	8 22		
						12	-	3 22.2	-	3 50.6	-	4 18.5	3	19 28	8 56	16 41	1 07	8 18		
24	178	51.8	-22	49.4		18	-	3 29.3	-	3 57.6	-	4 25.5	4	20 26	8 56	16 39	1 03	8 15		
						24	-	3 36.5	-	4 04.6	-	4 32.4								
code	-	+2																		

G M T	VENUS -4.3		MARS 0.9		JUPITER -2.2		SATURN 0.8		MOON			
	°	'	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
40	102 49.7	226 00.5	-15 51.4	109 59.4	-3 41.5	344 15.4	+21 14.5	236 03.3	-15 14.6	65 32.3	66 +19 15.7	+ 96
1	117 52.2	241 01.0	51.8	125 00.2	40.8	359 18.2	14.6	251 05.5	14.6	79 57.9	64 19 25.3	+ 94
2	132 54.7	256 01.4	52.2	140 01.0	40.0	14 21.0	14.7	266 07.8	14.7	94 23.3	64 19 34.7	+ 93
3	147 57.1	271 01.8	52.6	155 01.8	39.2	29 23.8	14.7	281 10.0	14.8	108 48.0	63 19 44.0	+ 92
4	162 59.6	286 02.3	52.9	170 02.7	38.5	44 26.6	14.8	296 12.3	14.8	123 14.0	61 19 53.2	+ 90
5	178 02.1	301 02.7	53.3	185 03.5	37.7	59 29.4	14.9	311 14.5	14.9	137 39.1	61 20 02.2	+ 90
6	193 04.5	316 03.1	-15 53.7	200 04.3	-3 37.0	74 32.2	+21 14.9	326 16.8	-15 14.9	152 04.2	60 +20 11.2	+ 88
7	208 07.0	331 03.6	54.1	215 05.2	36.2	89 35.0	15.0	341 19.0	15.0	166 29.2	59 20 20.0	+ 87
8	223 09.5	346 04.0	54.5	230 06.0	35.5	104 37.8	15.1	356 21.3	15.0	180 54.1	58 20 28.7	+ 85
9	238 11.9	1 04.4	54.9	245 06.8	34.7	119 40.6	15.1	11 23.5	15.1	195 18.9	57 +20 37.2	+ 84
10	253 14.4	16 04.9	55.3	260 07.7	33.9	134 43.4	15.2	26 25.8	15.1	209 43.6	56 20 45.6	+ 83
11	268 16.8	31 05.3	55.7	275 08.5	33.2	149 46.2	15.3	41 28.0	15.2	224 08.2	55 20 53.9	+ 82
12	283 19.3	46 05.7	-15 56.1	290 09.3	-3 32.4	164 49.0	+21 15.3	56 30.3	-15 15.2	238 32.7	55 +21 02.1	+ 80
13	298 21.8	61 06.2	56.5	305 10.2	31.7	179 51.8	15.4	71 32.5	15.3	252 57.2	53 +21 10.1	+ 79
14	313 24.2	76 06.6	56.9	320 11.0	30.9	194 54.6	15.5	86 34.8	15.3	267 21.5	53 21 18.0	+ 77
15	328 26.7	91 07.0	57.3	335 11.8	30.2	209 57.4	15.5	101 37.0	15.4	281 45.8	51 +21 25.7	+ 76
16	343 29.2	106 07.4	57.7	350 12.6	29.4	225 00.2	15.6	116 39.3	15.4	296 09.9	51 21 33.3	+ 75
17	358 31.6	121 07.8	58.1	5 13.5	28.7	240 03.0	15.7	131 41.5	15.5	310 34.0	50 21 40.8	+ 73
18	13 34.1	136 08.3	-15 58.5	20 14.3	-3 27.9	255 05.8	+21 15.7	146 43.8	-15 15.5	324 58.0	49 +21 48.1	+ 72
19	28 36.6	151 08.7	58.9	35 15.1	27.1	270 08.6	15.8	161 46.0	15.6	339 21.9	48 21 55.3	+ 70
20	43 39.0	166 09.1	59.2	50 16.0	26.4	285 11.4	15.9	176 48.3	15.6	353 45.7	47 22 02.3	+ 69
21	58 41.5	181 09.5	-15 59.6	65 16.8	25.6	300 14.2	15.9	191 50.5	15.7	8 09.4	46 +22 09.2	+ 67
22	73 44.0	196 09.9	16 00.0	80 17.6	24.9	315 17.0	16.0	206 52.8	15.7	22 33.0	46 +22 15.9	+ 66
23	88 46.4	211 10.3	00.4	95 18.5	24.1	330 19.8	16.1	221 55.0	15.8	36 56.6	45 22 22.5	+ 64
50	103 48.9	226 10.7	-16 00.8	110 19.3	-3 23.4	345 22.6	+21 16.1	236 57.3	-15 15.8	51 20.1	44 +22 28.9	+ 63
1	118 51.3	241 11.1	01.2	125 20.1	22.6	0 25.4	16.2	251 59.5	15.9	65 43.5	43 22 35.2	+ 61
2	133 53.8	256 11.5	01.6	140 21.0	21.8	15 28.2	16.3	267 01.8	15.9	80 06.8	43 22 41.3	+ 60
3	148 56.3	271 11.9	02.0	155 21.8	21.1	30 31.0	16.3	282 04.0	16.0	94 30.1	42 +22 47.3	+ 58
4	163 58.7	286 12.3	02.4	170 22.6	20.3	45 33.8	16.4	297 06.3	16.1	108 53.3	41 22 53.1	+ 56
5	179 01.2	301 12.7	02.8	185 23.5	19.6	60 36.7	16.5	312 08.5	16.1	123 16.4	40 +22 58.7	+ 55
6	194 03.7	316 13.1	-16 03.2	200 24.3	-3 18.8	75 39.5	+21 16.5	327 10.8	-15 16.2	137 39.4	40 +23 04.2	+ 53
7	209 06.1	331 13.5	03.6	215 25.1	18.1	90 42.3	16.6	342 13.0	16.2	152 02.4	39 23 09.5	+ 52
8	224 08.6	346 13.9	04.0	230 25.9	17.3	105 45.1	16.7	357 15.3	16.3	166 25.3	38 23 14.7	+ 50
9	239 11.1	1 14.3	04.4	245 26.8	16.5	120 47.9	16.7	12 17.5	16.3	180 48.1	38 +23 19.7	+ 48
10	254 13.5	16 14.7	04.8	260 27.6	15.8	135 50.7	16.8	27 19.8	16.4	195 10.9	37 23 24.5	+ 47
11	269 16.0	31 15.1	05.2	275 28.4	15.0	150 53.5	16.9	42 22.0	16.4	209 33.6	36 23 29.2	+ 45
12	284 18.5	46 15.5	-16 05.6	290 29.3	-3 14.3	165 56.3	+21 16.9	57 24.3	-15 16.5	223 56.2	36 +23 33.7	+ 44
13	299 20.9	61 15.9	06.0	305 30.1	13.5	180 59.1	17.0	72 26.5	16.5	238 18.8	35 23 38.1	+ 41
14	314 23.4	76 16.3	06.4	320 30.9	12.8	196 01.9	17.1	87 28.8	16.6	252 41.3	35 23 42.2	+ 40
15	329 25.8	91 16.6	06.8	335 31.8	12.0	211 04.7	17.2	102 31.0	16.6	267 03.8	34 +23 46.2	+ 38
16	344 28.3	106 17.0	07.2	350 32.6	11.3	226 07.5	17.2	117 33.3	16.7	281 26.2	34 23 50.0	+ 37
17	359 30.8	121 17.4	07.6	5 33.4	10.5	241 10.3	17.3	132 35.6	16.7	295 48.6	33 23 53.7	+ 35
18	14 33.2	136 17.8	-16 08.0	20 34.3	-3 09.7	256 13.1	+21 17.4	147 37.8	-15 16.8	310 10.9	33 +23 57.2	+ 33
19	29 35.7	151 18.2	08.5	35 35.1	09.0	271 15.9	17.4	162 40.1	16.8	324 33.2	32 24 00.5	+ 31
20	44 38.2	166 18.5	08.9	50 35.9	08.2	286 18.7	17.5	177 42.3	16.9	338 55.4	32 24 03.6	+ 30
21	59 40.6	181 18.9	09.3	65 36.8	07.5	301 21.5	17.6	192 44.6	16.9	353 17.6	32 +24 06.6	+ 28
22	74 43.1	196 19.3	09.7	80 37.6	06.7	316 24.3	17.6	207 46.8	17.0	7 39.8	31 24 09.4	+ 26
23	89 45.6	211 19.7	10.1	95 38.4	06.0	331 27.1	17.7	222 49.1	17.0	22 01.9	31 24 12.0	+ 24
60	104 48.0	226 20.0	-16 10.5	110 39.3	-3 05.2	346 29.9	+21 17.8	237 51.3	-15 17.1	36 24.0	30 +24 14.4	+ 23
1	119 50.5	241 20.4	10.9	125 40.1	04.4	1 32.7	17.8	252 53.6	17.1	50 46.0	30 24 16.7	+ 21
2	134 52.9	256 20.8	11.3	140 40.9	03.7	16 35.5	17.9	267 55.8	17.2	65 08.0	30 24 18.8	+ 19
3	149 55.4	271 21.1	11.7	155 41.8	02.9	31 38.3	18.0	282 58.1	17.2	79 30.0	30 +24 20.7	+ 17
4	164 57.9	286 21.5	12.1	170 42.6	02.2	46 41.1	18.0	298 00.3	17.3	93 52.0	29 24 22.4	+ 15
5	180 00.3	301 21.8	12.5	185 43.4	01.4	61 44.0	18.1	313 02.6	17.3	108 13.9	30 24 23.9	+ 14
6	195 02.8	316 22.2	-16 12.9	200 44.3	-3 00.7	76 46.8	+21 18.2	328 04.9	-15 17.4	122 35.9	29 +24 25.3	+ 12
7	210 05.3	331 22.6	13.3	215 45.1	2 59.9	91 49.6	18.2	343 07.1	17.4	136 57.8	28 24 26.5	+ 10
8	225 07.7	346 22.9	13.7	230 45.9	59.1	106 52.4	18.3	358 09.4	17.5	151 19.6	29 24 27.5	+ 8
9	240 10.2	1 23.3	14.1	245 46.8	58.4	121 55.2	18.4	13 11.6	17.5	165 41.5	29 +24 28.3	+ 6
10	255 12.7	16 23.6	14.5	260 47.6	57.6	136 58.0	18.4	28 13.9	17.6	180 03.4	28 24 28.9	+ 5
11	270 15.1	31 24.0	14.9	275 48.4	56.9	152 00.8	18.5	43 16.1	17.6	194 25.2	29 24 29.4	+ 3
12	285 17.6	46 24.3	-16 15.3	290 49.3	-2 56.1	167 03.6	+21 18.6	58 18.4	-15 17.7	208 47.1	28 +24 29.7	+ 1
13	300 20.1	61 24.7	15.7	305 50.1	55.4	182 06.4	18.6	73 20.6	17.7	223 08.9	29 24 29.8	- 1
14	315 22.5	76 25.0	16.2	320 50.9	54.6	197 09.2	18.7	88 22.9	17.8	237 30.8	28 24 29.7	- 3
15	330 25.0	91 25.4	16.6	335 51.8	53.8	212 12.0	18.8	103 25.2	17.8	251 52.6	29 +24 29.4	- 4
16	345 27.4	106 25.7	17.0	350 52.6	53.1	227 14.8	18.8	118 27.4	17.9	266 14.5	29 24 29.0	- 6
17	0 29.9	121 26.1	17.4	5 53.4	52.3	242 17.6	18.9	133 29.7	17.9	280 36.4	28 24 28.4	- 8
18	15 32.4	136 26.4	-16 17.8	20 54.3	-2 51.6	257 20.4	+21 19.0	148 31.9	-15 18.0	294 58.2	29 +24 27.6	- 10
19	30 34.8	151 26.8	18.2	35 55.1	50.8	272 23.2	19.0	163 34.2	18.0	309 20.1	29 24 26.6	- 12
20	45 37.3	166 27.1	18.6	50 55.9	50.1	287 26.0	19.1	178 36.4	18.1	323 42.0	29 24 25.4	- 13
21	60 39.8	181 27.4	19.0	65 56.7	49.3	302 28.9	19.2	193 38.7	18.1	338 03.9	30 +24 24.1	- 16
22	75 42.2	196 27.8	19.4	80 57.6	48.5	317 31.7	19.2	208 41.0	18.2	352 25.9	29 24 22.5	- 17
23	90 44.7	211 28.1	19.8	95 58.4	47.8	332 34.5	19.3	223 43.2	18.2	6 47.8	30 24 20.8	- 18
24	105 47.2	226 28.4	-16 20.2	110 59.2	-2 47.0	347 37.3	+21 19.4	238 45.5	-15 18.3	21 09.8	30 +24 19.0	- 21
code	-	+ 4	- 4	+ 8	+ 8	+ 28	+ 1	+ 22	0			

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS				
	GHA	Dec.	No.	Name	SHA	Dec.								Alt.	Sun's Lower Limb Add	Venus Add	Mars Add	
	h ° ' "	° ' "			° ' "	° ' "	N ° ' "	h m s	h m s	h m s	h m s	h m s	h m s					
4	0	178 51.8	-22 49.4	7	Acamar	315 51.3	-40 29.2	72	6 52	□	□	□	□	Alt.				
	1	193 51.5	49.2	5	Achernar	335 59.1	-57 28.1	70	6 44	□	□	□	□	0				
	2	208 51.2	49.0	30	Acrux	173 58.4	-62 50.8	68	11 35	6 38	9 28	□	□	30	0.6	0.3	0.1	
	3	223 50.9	48.7	19	Adhara	255 46.6	-28 54.6	66	10 21	6 33	10 11	10 00	□	45	0.6	0.2	0.1	
	4	238 50.6	48.5	10	Aldebaran	291 39.4	+16 25.3	64	9 46	6 27	10 40	10 53	11 32	60	0.6	0.2	0.1	
	5	253 50.3	48.2					62	9 20	6 22	11 02	11 26	12 13	75	0.6	0.2	0.1	
	6	268 50.0	-22 48.0	32	Alioth	166 58.9	+56 11.8	60	9 00	6 18	11 20	11 50	12 41	90	0.6	0.0	0.0	
	7	283 49.8	47.7	34	Alkaid	153 33.4	+49 31.9	58	8 44	6 14	11 35	12 09	13 02					
	8	298 49.5	47.5	55	Al Na'ir	28 38.9	-47 10.9	56	8 30	6 10	11 48	12 26	13 20					
	9	313 49.2	47.2	15	Anilam	276 30.5	-1 13.8	54	8 18	6 07	11 59	12 39	13 35					
	10	328 48.9	47.0	25	Alphard	218 38.8	-8 27.9	52	8 08	6 03	12 09	12 52	13 48					
	11	343 48.6	46.7					50	7 58	6 00	12 18	13 02	14 00					
	12	358 48.3	-22 46.5	41	Alphecca	126 48.3	+26 51.7	45	7 38	5 52	12 38	13 25	14 24					
	13	13 48.0	46.2	1	Alpheratz	358 29.0	+28 50.8	40	7 22	5 45	12 53	13 43	14 43					
	14	28 47.8	45.9	51	Altair	62 51.3	+8 44.9	35	7 09	5 38	13 06	13 59	14 59					
	15	43 47.5	45.7	2	Ankaa	353 58.8	-42 33.1	30	6 57	5 32	13 18	14 12	15 13					
	16	58 47.2	45.4	42	Antares	113 20.3	-26 20.0	20	6 36	5 18	13 38	14 35	15 37					
	17	73 46.9	45.2					10	6 18	5 03	13 55	14 55	15 57					
	18	88 46.6	-22 44.9	37	Arcturus	146 35.8	+19 24.7	0	6 02	4 46	14 12	15 13	16 16					
	19	103 46.3	44.7	43	Atria	109 02.0	-68 56.8	10	5 44	4 27	14 28	15 32	16 36					
	20	118 46.0	44.4	22	Avior	234 35.4	-59 21.8	20	5 26	4 02	14 46	15 52	16 56					
	21	133 45.8	44.1	13	Bellatrix	279 18.7	+6 18.6	30	5 05	3 29	15 07	16 15	17 20					
	22	148 45.5	43.9	16	Betelge'se	271 48.4	+7 24.0	35	4 52	3 05	15 19	16 29	17 34					
	23	163 45.2	43.6					40	4 38	2 36	15 32	16 44	17 51					
				17	Canopus	264 15.0	-52 40.3	45	4 20	1 51	15 49	17 03	18 10					
5	0	178 44.9	-22 43.4	12	Capella	281 38.7	+45 57.4	50	3 59	///	16 09	17 27	18 34					
	1	193 44.6	43.1	53	Deneb	50 01.8	+45 07.3	52	3 49	///	16 19	17 38	18 46					
	2	208 44.3	42.8	28	Denebola	183 18.1	+14 49.2	54	3 37	///	16 30	17 51	18 59					
	3	223 44.1	42.6	4	Diphda	349 39.8	-18 14.0	56	3 23	///	16 43	18 06	19 14					
	4	238 43.8	42.3					58	3 08	///	16 57	18 24	19 33					
	5	253 43.5	42.0	27	Dubhe	194 44.8	+61 59.3	60	2 49	///	17 15	18 45	19 55					
	6	268 43.2	-22 41.8	14	Elnath	279 07.6	+28 34.3	S										
	7	283 42.9	41.5	47	Eltanin	91 07.0	+51 29.5	Lat. Sunset Twlt. ends				Moonset						
	8	298 42.7	41.2	54	Enif	34 30.4	+9 40.2											
	9	313 42.4	40.9	56	Fomalhaut	16 12.4	-29 51.7											
	10	328 42.1	40.7															
	11	343 41.8	40.4	31	Gacrux	172 49.8	-56 51.5	72	17 19	□	□	□	□	Alt.				
	12	358 41.5	-22 40.1	29	Gienah	176 37.3	-17 17.6	70	17 27	□	□	□	□	0				
	13	13 41.2	39.9	35	Hadar	149 50.4	-60 09.3	68	12 36	17 34	6 11	□	□	30	19.4	19.7	19.9	
	14	28 41.0	39.6	6	Hamal	328 50.1	+23 15.2	66	13 49	17 39	5 29	7 46	□	4	19.4	19.7	19.9	
	15	43 40.7	39.3	48	Kaus Aust.	84 42.3	-34 24.5	64	14 25	17 44	5 01	6 53	8 27	12	19.3	19.7	19.8	
	16	58 40.4	39.0					62	14 51	17 49	4 39	6 21	7 46	16	19.3	19.7	19.8	
	17	73 40.1	38.8	40	Kochab	137 18.4	+74 20.0	60	15 10	17 53	4 22	5 57	7 18	20	19.2	19.6	19.7	
	18	88 39.8	-22 38.5	57	Markab	14 22.1	+14 57.9	58	15 27	17 57	4 08	5 38	6 57	24	19.2	19.5	19.6	
	19	103 39.6	38.2	8	Menkar	315 00.7	+3 54.9	56	15 41	18 01	3 55	5 22	6 39	28	19.1	19.4	19.5	
	20	118 39.3	37.9	36	Menkent	148 59.4	-36 08.9	54	15 53	18 05	3 44	5 09	6 24	32	19.0	19.3	19.4	
	21	133 39.0	37.6	24	Miap'l'dus	221 48.4	-69 31.8	52	16 03	18 08	3 35	4 57	6 11	36	18.9	19.2	19.3	
	22	148 38.7	37.4					50	16 13	18 11	3 26	4 46	5 59	40	18.7	19.1	19.2	
	23	163 38.5	37.1	9	Mirfak	309 42.8	+49 42.4	45	16 32	18 18	3 08	4 24	5 35	44	18.6	18.9	19.0	
				50	Nunki	76 52.9	-26 21.3	40	16 48	18 25	2 54	4 07	5 16	48	18.5	18.7	18.8	
	6	0	178 38.2	-22 36.8	52	Peacock	54 28.6	-56 52.9	35	17 02	18 32	2 41	3 52	5 00	52	18.3	18.6	18.7
	1	193 37.9	36.5	21	Pollux	244 20.8	+28 08.1	30	17 14	18 39	2 30	3 39	4 46	5 49	56	18.1	18.4	18.5
	2	208 37.6	36.2	20	Procyon	245 45.2	+5 20.4	20	17 34	18 52	2 12	3 17	4 23	5 26	60	18.0	18.2	18.3
	3	223 37.3	36.0					10	17 52	19 07	1 56	2 58	4 02	5 06	64	17.8	18.0	18.1
	4	238 37.1	35.7	46	R'alhague	96 47.4	+12 35.4	0	18 09	19 24	1 41	2 40	3 43	4 47	68	17.6	17.8	17.9
	5	253 36.8	35.4	26	Regulus	208 29.8	+12 11.1	10	18 26	19 43	1 26	2 23	3 24	4 28	72	17.4	17.6	17.6
	6	268 36.5	-22 35.1	11	Rigel	281 53.8	-8 15.2	20	18 44	20 07	1 10	2 04	3 03	4 07	76	17.2	17.4	17.4
	7	283 36.2	34.8	38	Rigil Kent.	140 52.0	-60 39.0	30	19 05	20 40	0 52	1 42	2 40	3 44	80	17.0	17.1	17.2
	8	298 36.0	34.5	44	Sabik	103 03.1	-15 40.3	35	19 18	21 03	0 42	1 30	2 26	3 30	84	16.8	16.9	17.0
	9	313 35.7	34.2					40	19 32	21 33	0 30	1 15	2 10	3 14	88	16.6	16.7	16.7
	10	328 35.4	33.9	3	Schedar	350 30.7	+56 17.8	45	19 49	22 16	0 15	0 58	1 50	2 55	90	16.4	16.5	16.5
	11	343 35.1	33.7	45	Shaula	97 21.8	-37 04.4	50	20 11	///	24 36	0 36	1 27	2 31				
	12	358 34.8	-22 33.4	18	Sirius	259 12.0	-16 39.2	52	20 21	///	24 26	0 26	1 15	2 19				
	13	13 34.6	33.1	33	Spica	159 17.5	-10 55.7	54	20 33	///	24 15	0 15	1 02	2 06				
	14	28 34.3	32.8	23	Suhail	223 24.3	-43 15.0	56	20 46	///	24 02	0 02	0 47	1 51				
	15	43 34.0	32.5					58	21 02	///	23 47	24 29	0 29	1 33				
	16	58 33.7	32.2	49	Vega	81 09.0	+38 44.4	60	21 21	///	23 29	24 07	0 07	1 11				
	17	73 33.5	31.9	39	Zub'g'bi	137 54.1	-15 51.4	S										
	18	88 33.2	-22 31.6	Equation of Time (App.—Mean)				GMT of Transit				Meridian of Greenwich						
	19	103 32.9	31.3															
	20	118 32.6	31.0															
	21	133 32.4	30.7															
	22	148 32.1	30.4															
	23	163 31.8	30.1															

G M T	T GHA	VENUS -4.3		MARS 0.9		JUPITER -2.2		SATURN 0.8		MOON			
		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
7 0	105 47.2	226 28.4	-16 20.2	110 59.2	-2 47.0	347 37.3	+21 19.4	238 45.5	-15 18.3	21 09.8	30	+24 19.0	-21
1	120 49.6	241 28.8	20.7	126 00.1	46.3	2 40.1	19.4	253 47.7	18.3	35 31.8	31	24 16.9	-22
2	135 52.1	256 29.1	21.1	141 00.9	45.5	17 42.9	19.5	268 50.0	18.4	49 53.9	31	24 14.7	-25
3	150 54.6	271 29.4	21.5	156 01.7	44.8	32 45.7	19.6	283 52.2	18.4	64 16.0	31	24 12.2	-25
4	165 57.0	286 29.8	21.9	171 02.6	44.0	47 48.5	19.6	298 54.5	18.5	78 38.1	31	24 09.7	-28
5	180 59.5	301 30.1	22.3	186 03.4	43.2	62 51.3	19.7	313 56.8	18.5	93 00.2	32	24 06.9	-30
6	196 01.9	316 30.4	-16 22.7	201 04.2	-2 42.5	77 54.1	+21 19.8	328 59.0	-15 18.6	107 22.4	32	+24 03.9	-31
7	211 04.4	331 30.7	23.1	216 05.1	41.7	92 56.9	19.9	344 01.3	18.6	121 44.6	33	24 00.8	-33
8	226 06.9	346 31.0	23.5	231 05.9	41.0	107 59.7	19.9	359 03.5	18.7	136 06.9	33	23 57.5	-34
9	241 09.3	1 31.4	23.9	246 06.7	40.2	123 02.5	20.0	14 05.8	18.7	150 29.2	34	23 54.1	-37
10	256 11.8	16 31.7	24.4	261 07.6	39.5	138 05.4	20.1	29 08.0	18.8	164 51.6	34	23 50.4	-38
11	271 14.3	31 32.0	24.8	276 08.4	38.7	153 08.2	20.1	44 10.3	18.8	179 14.0	35	23 46.6	-40
12	286 16.7	46 32.3	-16 25.2	291 09.3	-2 37.9	168 11.0	+21 20.2	59 12.6	-15 18.9	193 36.5	35	+23 42.6	-41
13	301 19.2	61 32.6	25.6	306 10.1	37.2	183 13.8	20.3	74 14.8	18.9	207 59.0	36	23 38.5	-43
14	316 21.7	76 32.9	26.0	321 10.9	36.4	198 16.6	20.3	89 17.1	19.0	222 21.6	37	23 34.2	-45
15	331 24.1	91 33.2	26.4	336 11.8	35.7	213 19.4	20.4	104 19.3	19.0	236 44.3	37	23 29.7	-47
16	346 26.6	106 33.6	26.8	351 12.6	34.9	228 22.2	20.5	119 21.6	19.1	251 07.0	38	23 25.0	-48
17	1 29.1	121 33.9	27.2	6 13.4	34.2	243 25.0	20.5	134 23.9	19.1	265 29.8	38	23 20.2	-50
18	16 31.5	136 34.2	-16 27.7	21 14.3	-2 33.4	258 27.8	+21 20.6	149 26.1	-15 19.2	279 52.6	39	+23 15.2	-51
19	31 34.0	151 34.5	28.1	36 15.1	32.6	273 30.6	20.7	164 28.4	19.2	294 15.5	40	23 10.1	-53
20	46 36.4	166 34.8	28.5	51 15.9	31.9	288 33.4	20.7	179 30.6	19.3	308 38.5	40	23 04.8	-55
21	61 38.9	181 35.1	28.9	66 16.8	31.1	303 36.3	20.8	194 32.9	19.3	323 01.5	41	22 59.3	-56
22	76 41.4	196 35.4	29.3	81 17.6	30.4	318 39.1	20.9	209 35.2	19.4	337 24.6	42	22 53.7	-58
23	91 43.8	211 35.7	29.7	96 18.4	29.6	333 41.9	20.9	224 37.4	19.4	351 47.8	43	22 47.9	-59
8 0	106 46.3	226 36.0	-16 30.1	111 19.3	-2 28.9	348 44.7	+21 21.0	239 39.7	-15 19.5	6 11.1	44	+22 42.0	-61
1	121 48.8	241 36.3	30.6	126 20.1	28.1	3 47.5	21.1	254 41.9	19.5	20 34.5	44	22 35.9	-63
2	136 51.2	256 36.6	31.0	141 20.9	27.3	18 50.3	21.1	269 44.2	19.5	34 57.9	45	22 29.6	-64
3	151 53.7	271 36.9	31.4	156 21.8	26.6	33 53.1	21.2	284 46.5	19.6	49 21.4	46	22 23.2	-65
4	166 56.2	286 37.1	31.8	171 22.6	25.8	48 55.9	21.3	299 48.7	19.6	63 45.0	47	22 16.7	-67
5	181 58.6	301 37.4	32.2	186 23.4	25.1	63 58.7	21.3	314 51.0	19.7	78 08.7	48	22 10.0	-69
6	197 01.1	316 37.7	-16 32.6	201 24.3	-2 24.3	79 01.5	+21 21.4	329 53.2	-15 19.7	92 32.5	48	+22 03.1	-70
7	212 03.5	331 38.0	33.0	216 25.1	23.6	94 04.4	21.5	344 55.5	19.8	106 56.3	49	21 56.1	-71
8	227 06.0	346 38.3	33.5	231 25.9	22.8	109 07.2	21.5	359 57.8	19.8	121 20.2	51	21 49.0	-73
9	242 08.5	1 38.6	33.9	246 26.8	22.0	124 10.0	21.6	15 00.0	19.9	135 44.3	51	21 41.7	-75
10	257 10.9	16 38.9	34.3	261 27.6	21.3	139 12.8	21.7	30 02.3	19.9	150 08.4	52	21 34.2	-75
11	272 13.4	31 39.1	34.7	276 28.4	20.5	154 15.6	21.7	45 04.5	20.0	164 32.6	53	21 26.7	-77
12	287 15.9	46 39.4	-16 35.1	291 29.3	-2 19.8	169 18.4	+21 21.8	60 06.8	-15 20.0	178 56.9	54	+21 19.0	-79
13	302 18.3	61 39.7	35.5	306 30.1	19.0	184 21.2	21.9	75 09.1	20.1	193 21.3	55	21 11.1	-80
14	317 20.8	76 40.0	36.0	321 30.9	18.3	199 24.0	21.9	90 11.3	20.1	207 45.8	56	21 03.1	-81
15	332 23.3	91 40.3	36.4	336 31.8	17.5	214 26.8	22.0	105 13.6	20.2	222 10.4	57	20 55.0	-82
16	347 25.7	106 40.5	36.8	351 32.6	16.7	229 29.7	22.1	120 15.9	20.2	236 35.1	58	20 46.8	-84
17	2 28.2	121 40.8	37.2	6 33.4	16.0	244 32.5	22.1	135 18.1	20.3	250 59.9	59	20 38.4	-85
18	17 30.7	136 41.1	-16 37.6	21 34.3	-2 15.2	259 35.3	+21 22.2	150 20.4	-15 20.3	265 24.8	60	+20 29.9	-87
19	32 33.1	151 41.3	38.0	36 35.1	14.5	274 38.1	22.3	165 22.6	20.4	279 49.8	61	20 21.2	-87
20	47 35.6	166 41.6	38.5	51 35.9	13.7	289 40.9	22.3	180 24.9	20.4	294 14.9	62	20 12.5	-89
21	62 38.0	181 41.9	38.9	66 36.8	13.0	304 43.7	22.4	195 27.2	20.5	308 40.1	63	20 03.6	-90
22	77 40.5	196 42.1	39.3	81 37.6	12.2	319 46.5	22.5	210 29.4	20.5	323 05.4	64	19 54.6	-91
23	92 43.0	211 42.4	39.7	96 38.5	11.4	334 49.3	22.5	225 31.7	20.6	337 30.8	65	19 45.5	-93
9 0	107 45.4	226 42.7	-16 40.1	111 39.3	-2 10.7	349 52.1	+21 22.6	240 34.0	-15 20.6	351 56.3	66	+19 36.2	-94
1	122 47.9	241 42.9	40.5	126 40.1	09.9	4 55.0	22.7	255 36.2	20.7	6 21.9	67	19 26.8	-94
2	137 50.4	256 43.2	41.0	141 41.0	09.2	19 57.8	22.8	270 38.5	20.7	20 47.6	68	19 17.4	-96
3	152 52.8	271 43.4	41.4	156 41.8	08.4	35 00.6	22.8	285 40.7	20.7	35 13.4	69	19 07.8	-97
4	167 55.3	286 43.7	41.8	171 42.6	07.7	50 03.4	22.9	300 43.0	20.8	49 39.7	70	18 58.1	-99
5	182 57.8	301 43.9	42.2	186 43.5	06.9	65 06.2	23.0	315 45.3	20.8	64 05.3	72	18 48.2	-99
6	198 00.2	316 44.2	-16 42.6	201 44.3	-2 06.1	80 09.0	+21 23.0	330 47.5	-15 20.9	78 31.5	72	+18 38.3	-100
7	213 02.7	331 44.5	43.1	216 45.1	05.4	95 11.8	23.1	345 49.8	20.9	92 57.7	73	18 28.3	-101
8	228 05.2	346 44.7	43.5	231 46.0	04.6	110 14.6	23.2	0 52.1	21.0	107 24.0	75	18 18.2	-103
9	243 07.6	1 45.0	43.9	246 46.8	03.9	125 17.5	23.2	15 54.3	21.0	121 50.5	75	18 07.9	-103
10	258 10.1	16 45.2	44.3	261 47.6	03.1	140 20.3	23.3	30 56.6	21.1	136 17.0	77	17 57.6	-105
11	273 12.5	31 45.4	44.7	276 48.5	02.4	155 23.1	23.4	45 58.9	21.1	150 43.7	77	17 47.1	-105
12	288 15.0	46 45.7	-16 45.2	291 49.3	-2 01.6	170 25.9	+21 23.4	61 01.1	-15 21.2	165 10.4	79	+17 36.6	-106
13	303 17.5	61 45.9	45.6	306 50.1	00.8	185 28.7	23.5	76 03.4	21.2	179 37.3	80	17 26.0	-107
14	318 19.9	76 46.2	46.0	321 51.0	2 00.1	200 31.5	23.6	91 05.7	21.3	194 04.3	81	17 15.3	-109
15	333 22.4	91 46.4	46.4	336 51.8	1 59.3	215 34.3	23.6	106 07.9	21.3	208 31.4	81	17 04.4	-109
16	348 24.9	106 46.7	46.8	351 52.7	58.6	230 37.1	23.7	121 10.2	21.4	222 58.5	83	16 53.5	-110
17	3 27.3	121 46.9	47.2	6 53.5	57.8	245 40.0	23.8	136 12.4	21.4	237 25.8	84	16 42.5	-110
18	18 29.8	136 47.1	-16 47.7	21 54.3	-1 57.0	260 42.8	+21 23.8	151 14.7	-15 21.5	251 53.2	85	+16 31.5	-112
19	33 32.3	151 47.4	48.1	36 55.2	56.3	275 45.6	23.9	166 17.0	21.5	266 20.7	86	16 20.3	-113
20	48 34.7	166 47.6	48.5	51 56.0	55.5	290 48.4	24.0	181 19.2	21.6	280 48.3	88	16 09.0	-113
21	63 37.2	181 47.8	48.9	66 56.8	54.8	305 51.2	24.0	196 21.5	21.6	295 16.1	88	15 57.7	-114
22	78 39.7	196 48.1	49.3	81 57.7	54.0	320 54.0	24.1	211 23.8	21.6	309 43.9	89	15 46.3	-115
23	93 42.1	211 48.3	49.8	96 58.5	53.3	335 56.8	24.2	226 26.0	21.7	324 11.8	90	15 34.8	-116
24	108 44.6	226 48.5	-16 50.2	111 59.3	-1 52.5	350 59.7	+21 24.2	241 28.3	-15 21.7	338 39.8	91	+15 23.2	-116
code	-	+ 3	- 4	+ 8	+ 8	+ 28	+ 1	+ 23	- 1				

G M T	SUN			STARS			Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS				
	GHA	Dec.	No.	Name	SHA	Dec.				7	8	9	10	Alt.	Sun's Lower Limb Add	Venus Add	Mars Add	
h	°	'					N	h	m	h	m	h	m	h	m			
7	178	31.6	-22 29.8	7	Acamar	315 51.3	-40 29.2	72	6 48	14 22	17 23							
1	193	31.3	29.5	5	Achernar	335 59.1	-57 28.1	70	6 42	15 21	17 44							
2	208	31.0	29.2	30	Acrux	173 58.3	-62 50.9	68	6 36	13 20	15 55	18 01						
3	223	30.7	28.9	19	Adhara	255 46.5	-28 54.6	66	6 30	11 52	14 14	16 20	18 14					
4	238	30.5	28.6	10	Aldebaran	291 39.4	+16 25.3	64	6 26	12 56	14 46	16 39	18 25					
5	253	30.2	28.3					62	6 21	13 31	15 10	16 54	18 34					
6	268	29.9	-22 28.0	32	Alioth	166 58.9	+56 11.8	60	6 17	13 56	15 29	17 07	18 42					
7	283	29.6	27.7	34	Alkaid	153 33.3	+49 31.8	58	6 13	14 16	15 45	17 18	18 49					
8	298	29.4	27.4	55	Al Na'ir	28 38.9	-47 10.9	56	6 09	14 33	15 58	17 28	18 55					
9	313	29.1	27.1	15	Alnilam	276 30.5	-1 13.8	54	6 06	14 47	16 10	17 36	19 00					
10	328	28.8	26.8	25	Alphard	218 38.8	-8 27.9	52	6 03	14 59	16 20	17 44	19 05					
11	343	28.6	26.5					50	6 00	15 10	16 29	17 50	19 10					
12	358	28.3	-22 26.2	41	Alphecca	126 48.3	+26 51.7	45	5 52	15 33	16 48	18 05	19 19					
13	13	28.0	25.8	1	Alpheratz	358 29.0	+28 50.8	40	5 45	15 51	17 03	18 17	19 27					
14	28	27.7	25.5	51	Altair	62 51.3	+8 44.9	35	5 39	16 06	17 17	18 27	19 34					
15	43	27.5	25.2	2	Ankaa	353 58.8	-42 33.1	30	5 32	16 19	17 28	18 35	19 40					
16	58	27.2	24.9	42	Antares	113 20.3	-26 20.0	20	5 19	16 42	17 47	18 50	19 50					
17	73	26.9	24.6					10	5 04	17 01	18 04	19 04	19 59					
18	88	26.7	-22 24.3	37	Arcturus	146 35.7	+19 24.7	0	4 47	17 20	18 20	19 16	20 07					
19	103	26.4	24.0	43	Atria	109 02.0	-68 56.8	10	5 46	4 29	17 38	18 35	19 28	20 16				
20	118	26.1	23.6	22	Avior	234 35.4	-59 21.8	20	5 28	4 04	17 57	18 52	19 41	20 25				
21	133	25.9	23.3	13	Bellatrix	279 18.7	+6 18.6	30	5 07	3 31	18 20	19 11	19 56	20 35				
22	148	25.6	23.0	16	Betelgeuse	271 48.4	+7 24.0	35	4 55	3 09	18 33	19 23	20 04	20 40				
23	163	25.3	22.7					40	4 41	2 40	18 48	19 35	20 14	20 47				
				17	Canopus	264 15.0	-52 40.3	45	4 24	1 56	19 06	19 50	20 26	20 55				
8	178	25.0	-22 22.4	12	Capella	281 38.7	+45 57.4	50	4 03	19 28	20 09	20 39	21 04					
1	193	24.8	22.1	53	Deneb	50 01.8	+45 07.3	52	3 52	19 39	20 17	20 46	21 08					
2	208	24.5	21.7	28	Denebola	183 18.1	+14 49.2	54	3 41	19 50	20 27	20 53	21 12					
3	223	24.2	21.4	4	Diphda	349 39.8	-18 14.0	56	3 28	20 04	20 37	21 00	21 18					
4	238	24.0	21.1					58	3 13	20 20	20 50	21 09	21 23					
5	253	23.7	20.8	27	Dubhe	194 44.8	+61 59.3	60	2 54	20 39	21 04	21 19	21 29					
6	268	23.4	-22 20.5	14	Elnath	279 07.6	+28 34.3	S										
7	283	23.2	20.1	47	Eltanin	91 07.0	+51 29.5											
8	298	22.9	19.8	54	Enif	34 30.4	+9 40.2											
9	313	22.6	19.5	56	Fomalhaut	16 12.4	-29 51.7											
10	328	22.4	19.2					N	h	m	h	m	h	m				
11	343	22.1	18.8	31	Gacrux	172 49.8	-56 51.5	72	17 24	12 01	10 51							
12	358	21.8	-22 18.5	29	Gienah	176 37.3	-17 17.6	70	17 32	11 01	10 27							
13	13	21.6	18.2	35	Hadar	149 50.3	-60 09.3	68	13 00	17 39	11 01	10 25	10 09					
14	28	21.3	17.8	6	Hamal	328 50.1	+23 15.2	66	13 59	17 44	10 21	10 06	9 59	9 54				
15	43	21.0	17.5	48	Kaus Aust.	84 42.3	-34 24.5	64	14 32	17 48	9 16	9 33	9 39	9 42				
16	58	20.8	17.2					62	14 57	17 53	8 41	9 09	9 23	9 31				
17	73	20.5	16.8	40	Kochab	137 18.4	+74 20.0	60	15 16	17 57	8 15	8 49	9 09	9 22				
18	88	20.2	-22 16.5	57	Makab	14 22.1	+14 57.9	58	15 32	18 01	7 55	8 33	8 58	9 14				
19	103	20.0	16.2	8	Menkar	315 00.7	+3 54.9	56	15 45	18 04	7 38	8 19	8 47	9 07				
20	118	19.7	15.8	36	Menkent	148 59.4	-36 08.9	54	15 57	18 08	7 24	8 07	8 38	9 01				
21	133	19.5	15.5	24	Misapl'dus	221 48.4	-69 31.8	52	16 07	18 11	7 11	7 57	8 30	8 55				
22	148	19.2	15.2					50	16 16	18 14	7 00	7 47	8 23	8 50				
23	163	18.9	14.8	9	Mirfak	309 42.8	+49 42.4	45	16 35	18 21	6 37	7 27	8 07	8 39				
				50	Nunki	76 52.9	-26 21.3	40	16 51	18 28	6 18	7 11	7 54	8 30				
9	178	18.7	-22 14.5	52	Peacock	54 28.6	-56 52.9	35	17 05	18 35	6 02	6 57	7 43	8 22				
1	193	18.4	14.2	21	Pollux	244 20.8	+28 08.1	30	17 16	18 41	5 49	6 45	7 33	8 14				
2	208	18.1	13.8	20	Procyon	245 45.2	+5 20.4	20	17 36	18 54	5 26	6 24	7 16	8 02				
3	223	17.9	13.5					10	17 54	19 09	5 06	6 06	7 01	7 51				
4	238	17.6	13.1	46	R'alhague	96 47.4	+12 35.4	0	18 10	19 24	4 47	5 49	6 47	7 41				
5	253	17.4	12.8	26	Regulus	208 29.8	+12 11.1	10	18 27	19 44	4 28	5 32	6 33	7 31				
6	268	17.1	-22 12.5	11	Rigel	281 53.8	-8 15.2	20	18 45	20 08	4 07	5 13	6 18	7 19				
7	283	16.8	12.1	38	Rigel Kent.	140 52.0	-60 39.0	30	19 05	20 40	3 44	4 52	6 00	7 07				
8	298	16.6	11.8	44	Sabik	103 03.1	-15 40.3	35	19 18	21 03	3 30	4 39	5 50	6 59				
9	313	16.3	11.4					40	19 32	21 31	3 14	4 25	5 38	6 51				
10	328	16.0	11.1	3	Schedar	350 30.7	+56 17.8	45	19 49	22 14	2 55	4 08	5 24	6 40				
11	343	15.8	10.7	45	Shaula	97 21.8	-37 04.4	50	20 10	22 14	2 31	3 46	5 07	6 28				
12	358	15.5	-22 10.4	18	Sirius	259 11.9	-16 39.2	52	20 20	22 14	2 19	3 36	4 59	6 23				
13	13	15.3	10.1	33	Spica	159 17.5	-10 55.7	54	20 31	22 14	2 06	3 24	4 50	6 16				
14	28	15.0	09.7	23	Suhail	223 24.3	-43 15.0	56	20 44	22 14	1 51	3 11	4 40	6 09				
15	43	14.7	09.4					58	20 59	22 14	1 33	2 55	4 28	6 01				
16	58	14.5	09.0	49	Vega	81 09.0	+38 44.4	60	21 17	22 14	1 11	2 37	4 15	5 52				
17	73	14.2	08.7	39	Zub'g'bi	137 54.1	-15 51.4	S										
18	88	14.0	-22 08.3															
19	103	13.7	08.0															
20	118	13.4	07.6															
21	133	13.2	07.3															
22	148	12.9	06.9															
23	163	12.7	06.5															
24	178	12.4	-22 06.2															
code	-	+ 3																

Subtract from table,
back cover

Full Moon

8

G M T	VENUS -4.2		MARS 1.0		JUPITER -2.2		SATURN 0.8		MOON				
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code	
h	°	'	°	'	°	'	°	'	°	'	°	'	
10	0	108 44.6	226 48.5	-16 50.2	111 59.3	-1 52.5	350 59.7	+21 24.2	241 28.3	-15 21.7	338 39.8	91 +15 23.2	-116
	1	123 47.0	241 48.7	50.6	127 00.2	51.7	6 02.5	24.3	256 30.6	21.8	353 07.9	93 15 11.6	-117
	2	138 49.5	256 49.0	51.0	142 01.0	51.0	21 05.3	24.4	271 32.8	21.8	7 36.2	93 14 59.9	-118
	3	153 52.0	271 49.2	.. 51.4	157 01.8	.. 50.2	36 08.1	.. 24.4	286 35.1	.. 21.9	22 04.5	94 14 48.1	-119
	4	168 54.4	286 49.4	51.9	172 02.7	49.5	51 10.9	24.5	301 37.4	21.9	36 32.9	96 14 36.2	-119
	5	183 56.9	301 49.6	52.3	187 03.5	48.7	66 13.7	24.6	316 39.6	22.0	51 01.5	96 14 24.3	-120
	6	198 59.4	316 49.9	-16 52.7	202 04.3	-1 48.0	81 16.5	+21 24.6	331 41.9	-15 22.0	65 30.1	97 +14 12.3	-120
	7	214 01.8	331 50.1	53.1	217 05.2	47.2	96 19.3	24.7	346 44.2	22.1	79 58.8	99 14 00.3	-121
	8	229 04.3	346 50.3	53.5	232 06.0	46.4	111 22.2	24.8	1 46.4	22.1	94 27.7	99 13 48.2	-122
	9	244 06.8	1 50.5	.. 54.0	247 06.9	.. 45.7	126 25.0	.. 24.8	16 48.7	.. 22.2	108 56.6	100 13 36.0	-123
	10	259 09.2	16 50.7	54.4	262 07.7	44.9	141 27.8	24.9	31 51.0	22.2	123 25.6	101 13 23.7	-123
	11	274 11.7	31 50.9	54.8	277 08.5	44.2	156 30.6	25.0	46 53.2	22.2	137 54.7	103 13 11.4	-123
	12	289 14.2	46 51.1	-16 55.2	292 09.4	-1 43.4	171 33.4	+21 25.0	61 55.5	-15 22.3	152 24.0	103 +12 59.1	-124
	13	304 16.6	61 51.4	55.6	307 10.2	42.7	186 36.2	25.1	76 57.8	22.3	166 53.3	104 12 46.7	-125
	14	319 19.1	76 51.6	56.1	322 11.0	41.9	201 39.0	25.2	92 00.1	22.4	181 22.7	105 12 34.2	-125
	15	334 21.5	91 51.8	.. 56.5	337 11.9	.. 41.1	216 41.9	.. 25.2	107 02.3	.. 22.4	195 52.2	106 12 21.7	-126
	16	349 24.0	106 52.0	56.9	352 12.7	40.4	231 44.7	25.3	122 04.6	22.5	210 21.8	107 12 09.1	-126
	17	4 26.5	121 52.2	57.3	7 13.5	39.6	246 47.5	25.4	137 06.9	22.5	224 51.5	108 11 56.5	-126
	18	19 28.9	136 52.4	-16 57.8	22 14.4	-1 38.9	261 50.3	+21 25.4	152 09.1	-15 22.6	239 21.3	109 +11 43.9	-127
	19	34 31.4	151 52.6	58.2	37 15.2	38.1	276 53.1	25.5	167 11.4	22.6	253 51.2	110 11 31.2	-128
	20	49 33.9	166 52.8	58.6	52 16.1	37.4	291 55.9	25.6	182 13.7	22.7	268 21.2	110 11 18.4	-128
	21	64 36.3	181 53.0	.. 59.0	67 16.9	.. 36.6	306 58.8	.. 25.6	197 15.9	.. 22.7	282 51.2	112 11 05.6	-128
	22	79 38.8	196 53.2	59.4	82 17.7	35.8	322 01.6	25.7	212 18.2	22.8	297 21.4	112 10 52.8	-129
	23	94 41.3	211 53.4	16 59.9	97 18.6	35.1	337 04.4	25.8	227 20.5	22.8	311 51.6	113 10 39.9	-129
11	0	109 43.7	226 53.6	-17 00.3	112 19.4	-1 34.3	352 07.2	+21 25.9	242 22.7	-15 22.8	326 21.9	115 +10 27.0	-129
	1	124 46.2	241 53.8	00.7	127 20.2	33.6	7 10.0	25.9	257 25.0	22.9	340 52.4	114 10 14.1	-130
	2	139 48.6	256 54.0	01.1	142 21.1	32.8	22 12.8	26.0	272 27.3	22.9	355 22.8	116 10 01.1	-130
	3	154 51.1	271 54.1	.. 01.5	157 21.9	.. 32.1	37 15.6	.. 26.1	287 29.5	.. 23.0	9 53.4	117 9 48.1	-130
	4	169 53.6	286 54.3	02.0	172 22.7	31.3	52 18.5	26.1	302 31.8	23.0	24 24.1	117 9 35.1	-131
	5	184 56.0	301 54.5	02.4	187 23.6	30.5	67 21.3	26.2	317 34.1	23.1	38 54.8	119 9 22.0	-131
	6	199 58.5	316 54.7	-17 02.8	202 24.4	-1 29.8	82 24.1	+21 26.3	332 36.4	-15 23.1	53 25.7	119 9 08.9	-132
	7	215 01.0	331 54.9	03.2	217 25.3	29.0	97 26.9	26.3	347 38.6	23.2	67 56.6	120 8 55.7	-131
	8	230 03.4	346 55.1	03.6	232 26.1	28.3	112 29.7	26.4	2 40.9	23.2	82 27.6	120 8 42.6	-132
	9	245 05.9	1 55.3	.. 04.1	247 26.9	.. 27.5	127 32.5	.. 26.5	17 43.2	.. 23.3	96 58.6	122 8 29.4	-132
	10	260 08.4	16 55.4	04.5	262 27.8	26.8	142 35.4	26.5	32 45.4	23.3	111 29.8	122 8 16.2	-133
	11	275 10.8	31 55.6	04.9	277 28.6	26.0	157 38.2	26.6	47 47.7	23.3	126 01.0	123 8 02.9	-133
	12	290 13.3	46 55.8	-17 05.3	292 29.4	-1 25.2	172 41.0	+21 26.7	62 50.0	-15 23.4	140 32.3	124 7 49.7	-133
	13	305 15.8	61 56.0	05.7	307 30.3	24.5	187 43.8	26.7	77 52.2	23.4	155 03.7	124 7 36.4	-133
	14	320 18.2	76 56.2	06.2	322 31.1	23.7	202 46.6	26.8	92 54.5	23.5	169 35.1	125 7 23.1	-133
	15	335 20.7	91 56.3	.. 06.6	337 31.9	.. 23.0	217 49.4	.. 26.9	107 56.8	.. 23.5	184 06.6	126 7 09.8	-133
	16	350 23.1	106 56.5	07.0	352 32.8	22.2	232 52.2	26.9	122 59.1	23.6	198 38.2	127 6 56.5	-134
	17	5 25.6	121 56.7	07.4	7 33.6	21.5	247 55.1	27.0	138 01.3	23.6	213 09.9	127 6 43.1	-133
	18	20 28.1	136 56.8	-17 07.9	22 34.5	-1 20.7	262 57.9	+21 27.1	153 03.6	-15 23.7	227 41.6	128 6 29.8	-134
	19	35 30.5	151 57.0	08.3	37 35.3	19.9	278 00.7	27.1	168 05.9	23.7	242 13.4	128 6 16.4	-134
	20	50 33.0	166 57.2	08.7	52 36.1	19.2	293 03.5	27.2	183 08.1	23.7	256 45.2	130 6 03.0	-134
	21	65 35.5	181 57.3	.. 09.1	67 37.0	.. 18.4	308 06.3	.. 27.3	198 10.4	.. 23.8	271 17.2	130 5 49.6	-134
	22	80 37.9	196 57.5	09.5	82 37.8	17.7	323 09.1	27.3	213 12.7	23.8	285 49.2	130 5 36.2	-134
	23	95 40.4	211 57.7	10.0	97 38.6	16.9	338 12.0	27.4	228 15.0	23.9	300 21.2	131 5 22.8	-134
12	0	110 42.9	226 57.8	-17 10.4	112 39.5	-1 16.2	353 14.8	+21 27.5	243 17.2	-15 23.9	314 53.3	132 5 09.4	-134
	1	125 45.3	241 58.0	10.8	127 40.3	15.4	8 17.6	27.5	258 19.5	24.0	329 25.5	133 4 56.0	-135
	2	140 47.8	256 58.2	11.2	142 41.2	14.6	23 20.4	27.6	273 21.8	24.0	343 57.8	133 4 42.5	-134
	3	155 50.3	271 58.3	.. 11.6	157 42.0	.. 13.9	38 23.2	.. 27.7	288 24.0	.. 24.1	358 30.1	133 4 29.1	-134
	4	170 52.7	286 58.5	12.1	172 42.8	13.1	53 26.0	27.7	303 26.3	24.1	13 02.4	134 4 15.7	-135
	5	185 55.2	301 58.6	12.5	187 43.7	12.4	68 28.9	27.8	318 28.6	24.1	27 34.8	135 4 02.2	-134
	6	200 57.6	316 58.8	-17 12.9	202 44.5	-1 11.6	83 31.7	+21 27.9	333 30.9	-15 24.2	42 07.3	135 3 48.8	-134
	7	216 00.1	331 58.9	13.3	217 45.3	10.9	98 34.5	27.9	348 33.1	24.2	56 39.8	136 3 35.4	-135
	8	231 02.6	346 59.1	13.7	232 46.2	10.1	113 37.3	28.0	3 35.4	24.3	71 12.4	136 3 21.9	-134
	9	246 05.0	1 59.2	.. 14.2	247 47.0	.. 09.3	128 40.1	.. 28.1	18 37.7	.. 24.3	85 45.0	137 3 08.5	-134
	10	261 07.5	16 59.4	14.6	262 47.9	08.6	143 42.9	28.1	33 40.0	24.4	100 17.7	138 2 55.1	-135
	11	276 10.0	31 59.5	15.0	277 48.7	07.8	158 45.8	28.2	48 42.2	24.4	114 50.5	138 2 41.6	-134
	12	291 12.4	46 59.7	-17 15.4	292 49.5	-1 07.1	173 48.6	+21 28.3	63 44.5	-15 24.5	129 23.3	138 2 28.2	-134
	13	306 14.9	61 59.8	15.9	307 50.4	06.3	188 51.4	28.3	78 46.8	24.5	143 56.1	139 2 14.8	-134
	14	321 17.4	77 00.0	16.3	322 51.2	05.6	203 54.2	28.4	93 49.1	24.5	158 29.0	139 2 01.4	-134
	15	336 19.8	92 00.1	.. 16.7	337 52.0	.. 04.8	218 57.0	.. 28.5	108 51.3	.. 24.6	173 01.9	140 1 48.0	-134
	16	351 22.3	107 00.3	17.1	352 52.9	04.0	233 59.8	28.5	123 53.6	24.6	187 34.9	140 1 34.6	-133
	17	6 24.8	122 00.4	17.5	7 53.7	03.3	249 02.7	28.6	138 55.9	24.7	202 07.9	141 1 21.3	-134
	18	21 27.2	137 00.5	-17 18.0	22 54.6	-1 02.5	264 05.5	+21 28.7	153 58.2	-15 24.7	216 41.0	141 1 07.9	-134
	19	36 29.7	152 00.7	18.4	37 55.4	01.8	279 08.3	28.7	169 00.4	24.8	231 14.1	141 0 54.5	-133
	20	51 32.1	167 00.8	18.8	52 56.2	01.0	294 11.1	28.8	184 02.7	24.8	245 47.2	142 0 41.2	-133
	21	66 34.6	182 00.9	.. 19.2	67 57.1	.. 00.3	309 13.9	.. 28.9	199 05.0	.. 24.9	260 20.4	143 0 27.9</	

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS			
	GHA	Dec.	No.	Name	SHA	Dec.				10	11	12	13	Alt.	Sun's Low'r Limb Add	Venus Add	Mars Add
10	0	178 12.4	-22 06.2	7	Acamar	315 51.3	-40 29.2	72	6 44	17 23	19 37	21 37	23 33				
	1	193 12.2	05.8	5	Achernar	335 59.1	-57 28.1	70	6 38	17 44	19 46	21 38	23 25				
	2	208 11.9	05.5	30	Acrux	173 58.3	-62 50.9	68	6 33	18 01	19 53	21 38	23 19				
	3	223 11.6	05.1	19	Adhara	255 46.5	-28 54.7	66	6 28	18 14	19 59	21 38	23 13				
	4	238 11.4	04.8	10	Aldebaran	291 39.4	+16 25.3	64	6 24	18 25	20 04	21 38	23 09				
	5	253 11.1	04.4					62	6 19	18 34	20 09	21 38	23 05				
	6	268 10.9	-22 04.0	32	Alioth	166 58.9	+56 11.8	60	6 15	18 42	20 12	21 39	23 01				
	7	283 10.6	03.7	34	Alkaid	153 33.3	+49 31.8	58	6 12	18 49	20 16	21 39	22 59				
	8	298 10.4	03.3	55	Al Na'ir	28 38.9	-47 10.9	56	6 08	18 55	20 19	21 39	22 56				
	9	313 10.1	03.0	15	Alnilam	276 30.5	-1 13.8	54	6 05	19 00	20 21	21 39	22 54				
	10	328 9.8	02.6	25	Alphard	218 38.8	-8 27.9	52	6 02	19 05	20 24	21 39	22 51				
	11	343 9.6	02.2					50	5 59	19 10	20 26	21 39	22 49				
	12	358 9.3	-22 01.9	41	Alphecca	126 48.3	+26 51.7	45	5 52	19 19	20 31	21 39	22 45				
	13	13 09.1	01.5	1	Alpheratz	358 29.0	+28 50.8	40	5 46	19 27	20 35	21 39	22 42				
	14	28 08.8	01.1	51	Altair	62 51.3	+8 44.9	35	5 39	19 34	20 38	21 40	22 39				
	15	43 08.6	00.8	2	Ankaa	353 58.8	-42 33.1	30	5 32	19 40	20 41	21 40	22 36				
	16	58 08.3	00.4	42	Antares	113 20.3	-26 20.0	20	5 19	19 50	20 46	21 40	22 31				
	17	73 08.1	22 00.0					10	5 05	19 59	20 51	21 40	22 28				
	18	88 07.8	-21 59.7	37	Arcturus	146 35.7	+19 24.7	0	4 50	20 07	20 55	21 40	22 24				
	19	103 07.6	59.3	43	Atria	109 01.9	-68 56.8	10	4 40	20 16	21 00	21 41	22 20				
	20	118 07.3	58.9	22	Avior	234 35.4	-59 21.9	20	4 06	20 25	21 04	21 41	22 16				
	21	133 07.1	58.6	13	Bellatrix	279 18.7	+6 18.6	30	3 34	20 35	21 09	21 41	22 12				
	22	148 06.8	58.2	16	Betelge'se	271 48.4	+7 24.0	35	3 13	20 40	21 12	21 41	22 09				
	23	163 06.5	57.8					40	3 01	20 47	21 15	21 42	22 07				
				17	Canopus	264 15.0	-52 40.3	45	2 23	20 55	21 19	21 42	22 03				
				12	Capella	281 38.7	+45 57.4	50	1 16	21 04	21 24	21 42	22 00				
				53	Deneb	50 01.8	+45 07.3	52	1 08	21 08	21 26	21 42	21 58				
				28	Denebola	183 18.1	+14 49.2	54	1 12	21 08	21 28	21 42	21 56				
				4	Diphda	349 39.8	-18 14.0	56	1 18	21 18	21 31	21 43	21 54				
								58	1 23	21 23	21 34	21 43	21 51				
				27	Dubhe	194 44.7	+61 59.3	60	1 29	21 29	21 37	21 43	21 49				
				14	Elnath	279 07.6	+28 34.3	S									
				47	Eltanin	91 07.0	+51 29.5										
				54	Enif	34 30.4	+9 40.2										
				56	Fomalhaut	16 12.4	-29 51.7										
				31	Gacrux	172 49.7	-56 51.6	72	17 31	10 51	10 18	9 54	9 31				
				29	Gienah	176 37.3	-17 17.6	70	17 38	10 27	10 06	9 50	9 34				
				35	Hadar	149 50.3	-60 09.3	68	13 20	10 09	9 57	9 47	9 37				
				6	Hamel	328 50.1	+23 15.2	66	14 10	10 50	9 54	9 49	9 39				
				48	Kaus Aust.	84 42.2	-34 24.5	64	14 40	10 53	9 42	9 42	9 41				
								62	15 03	10 57	9 31	9 36	9 40				
				40	Kochab	137 18.3	+74 20.0	60	15 22	11 02	9 22	9 31	9 38				
				57	Makab	14 22.2	+14 57.9	58	15 37	11 05	9 14	9 27	9 36				
				8	Menkar	315 00.7	+3 54.9	56	15 50	11 08	9 07	9 22	9 35				
				36	Menkent	148 59.4	-36 08.9	54	16 01	11 11	9 01	9 19	9 34				
				24	Miap'l'dus	221 48.4	-69 31.8	52	16 11	11 14	8 55	9 16	9 33				
								50	16 20	11 17	8 50	9 12	9 32				
				9	Miraf	309 42.8	+49 42.4	45	16 39	11 24	8 39	9 06	9 29				
				50	Nunki	76 52.9	-26 21.1	40	16 54	11 30	8 30	9 00	9 27				
				52	Peacock	54 28.6	-56 52.9	35	17 07	11 37	8 22	8 55	9 26				
				21	Pollux	244 20.8	+28 08.1	30	17 19	11 43	8 14	8 51	9 24				
				20	Procyon	245 45.2	+5 20.4	20	17 38	11 56	8 02	8 44	9 22				
								10	17 55	12 10	7 51	8 37	9 19				
				46	R'alhague	96 47.4	+12 35.4	0	18 12	12 26	7 41	8 31	9 17				
				26	Regulus	208 29.8	+12 11.1	10	18 28	12 45	7 31	8 24	9 15				
				11	Rigel	281 53.8	-8 15.2	20	18 45	13 08	7 19	8 17	9 12				
				38	Rigel Kent.	140 51.9	-60 39.0	30	19 05	13 29	7 07	8 10	9 10				
				44	Sabik	103 03.0	-15 40.3	35	19 17	13 41	6 59	8 05	9 08				
								40	19 31	13 56	6 51	8 00	9 06				
				3	Schedar	350 30.7	+56 17.8	45	19 48	14 10	6 40	7 54	9 04				
				45	Shaula	97 21.7	-37 04.3	50	20 23	14 43	6 28	7 47	9 01				
				18	Sirius	259 11.9	-16 39.3	52	20 18	15 01	6 23	7 43	9 00				
				33	Spica	159 17.4	-10 55.7	54	20 29	15 16	6 16	7 40	8 59				
				23	Suhail	223 24.3	-43 15.0	56	20 41	15 31	6 09	7 35	8 57				
								58	20 56	15 46	6 01	7 31	8 56				
				49	Vega	81 09.0	+38 44.4	60	21 13	16 01	5 52	7 26	8 54				
				39	Zub'g'bi	137 54.1	-15 51.4	S									

G M T	☿	VENUS -4.2			MARS 1.0			JUPITER -2.2			SATURN 0.8			MOON			
		GHA		Dec.	GHA		Dec.	GHA		Dec.	GHA		Dec.	GHA	code	Dec.	code
13 0	111 42.0	227 01.3	-17 20.5	112 59.6	- 0 58.0	354 22.4	+21 29.1	244 11.8	-15 25.0	304 00.2	144 - 0 12.0	-133					
1 1	126 44.5	242 01.5	20.9	128 00.4	57.2	9 25.2	29.1	259 14.1	25.0	318 33.6	143 0 25.3	-132					
2 2	141 46.9	257 01.6	21.3	143 01.2	56.5	24 28.0	29.2	274 16.4	25.1	333 06.9	144 0 38.5	-132					
3 3	156 49.4	272 01.7	.. 21.7	158 02.1	.. 55.7	39 30.8	.. 29.3	289 18.6	.. 25.1	347 40.3	145 0 51.7	-132					
4 4	171 51.9	287 01.9	22.2	173 02.9	55.0	54 33.7	29.3	304 20.9	25.2	2 13.8	145 1 04.9	-132					
5 5	186 54.3	302 02.0	22.6	188 03.8	54.2	69 36.5	29.4	319 23.2	25.2	16 47.3	145 1 18.1	-132					
6 6	201 56.8	317 02.1	-17 23.0	203 04.6	- 0 53.5	84 39.3	+21 29.5	334 25.5	-15 25.2	31 20.8	145 - 1 31.3	-131					
7 7	216 59.2	332 02.2	23.4	218 05.4	52.7	99 42.1	29.5	349 27.7	25.3	45 54.3	146 1 44.4	-131					
8 8	232 01.7	347 02.3	23.8	233 06.3	51.9	114 44.9	29.6	4 30.0	25.3	60 27.9	145 1 57.5	-131					
9 9	247 04.2	2 02.5	.. 24.2	248 07.1	.. 51.2	129 47.7	.. 29.7	19 32.3	.. 25.4	75 01.4	147 2 10.6	-131					
10 10	262 06.6	17 02.6	24.7	263 07.9	50.4	144 50.6	29.7	34 34.6	25.4	89 35.1	146 2 23.7	-130					
11 11	277 09.1	32 02.7	25.1	278 08.8	49.7	159 53.4	29.8	49 36.8	25.5	104 08.7	147 2 36.7	-130					
12 12	292 11.6	47 02.8	-17 25.5	293 09.6	- 0 48.9	174 56.2	+21 29.9	64 39.1	-15 25.5	118 42.4	146 - 2 49.7	-130					
13 13	307 14.0	62 02.9	25.9	308 10.5	48.2	189 59.0	29.9	79 41.4	25.5	133 16.0	148 3 02.7	-129					
14 14	322 16.5	77 03.0	26.3	323 11.3	47.4	205 01.8	30.0	94 43.7	25.6	147 49.8	147 3 15.6	-130					
15 15	337 19.0	92 03.2	.. 26.8	338 12.1	.. 46.6	220 04.7	.. 30.1	109 45.9	.. 25.6	162 23.5	147 3 28.6	-129					
16 16	352 21.4	107 03.3	27.2	353 13.0	45.9	235 07.5	30.1	124 48.2	25.7	176 57.2	148 3 41.5	-128					
17 17	7 23.9	122 03.4	27.6	8 13.8	45.1	250 10.3	30.2	139 50.5	25.7	191 31.0	148 3 54.3	-129					
18 18	22 26.4	137 03.5	-17 28.0	23 14.7	- 0 44.4	265 13.1	+21 30.3	154 52.8	-15 25.8	206 04.8	148 - 4 07.2	-128					
19 19	37 28.8	152 03.6	28.4	38 15.5	43.6	280 15.9	30.3	169 55.1	25.8	220 38.6	148 4 20.0	-127					
20 20	52 31.3	167 03.7	28.9	53 16.3	42.9	295 18.7	30.4	184 57.3	25.8	235 12.4	148 4 32.7	-128					
21 21	67 33.7	182 03.8	.. 29.3	68 17.2	.. 42.1	310 21.6	.. 30.5	199 59.6	.. 25.9	249 46.2	149 4 45.5	-127					
22 22	82 36.2	197 03.9	29.7	83 18.0	41.3	325 24.4	30.5	215 01.9	25.9	264 20.1	149 4 58.2	-127					
23 23	97 38.7	212 04.0	30.1	98 18.8	40.6	340 27.2	30.6	230 04.2	26.0	278 54.0	148 5 10.9	-126					
14 0	112 41.1	227 04.1	-17 30.5	113 19.7	- 0 39.8	355 30.0	+21 30.7	245 06.5	-15 26.0	293 27.8	149 - 5 23.5	-126					
1 1	127 43.6	242 04.2	30.9	128 20.5	39.1	10 32.8	30.7	260 08.7	26.1	308 01.7	149 5 36.1	-126					
2 2	142 46.1	257 04.3	31.4	143 21.4	38.3	25 35.7	30.8	275 11.0	26.1	322 35.6	149 5 48.7	-125					
3 3	157 48.5	272 04.4	.. 31.8	158 22.2	.. 37.6	40 38.5	.. 30.9	290 13.3	.. 26.1	337 09.5	149 6 01.2	-125					
4 4	172 51.0	287 04.5	32.2	173 23.0	36.8	55 41.3	30.9	305 15.6	26.2	351 43.4	150 6 13.7	-124					
5 5	187 53.5	302 04.6	32.6	188 23.9	36.1	70 44.1	31.0	320 17.8	26.2	6 17.4	149 6 26.1	-124					
6 6	202 55.9	317 04.7	-17 33.0	203 24.7	- 0 35.3	85 46.9	+21 31.1	335 20.1	-15 26.3	20 51.3	149 - 6 38.5	-124					
7 7	217 58.4	332 04.8	33.4	218 25.5	34.5	100 49.7	31.1	350 22.4	26.3	35 25.2	150 6 50.9	-123					
8 8	233 00.9	347 04.9	33.9	233 26.4	33.8	115 52.6	31.2	5 24.7	26.4	49 59.2	149 7 03.2	-123					
9 9	248 03.3	2 04.9	.. 34.3	248 27.2	.. 33.0	130 55.4	.. 31.3	20 27.0	.. 26.4	64 33.1	150 7 15.5	-122					
10 10	263 05.8	17 05.0	34.7	263 28.1	32.3	145 58.2	31.3	35 29.2	26.4	79 07.1	149 7 27.7	-123					
11 11	278 08.2	32 05.1	35.1	278 28.9	31.5	161 01.0	31.4	50 31.5	26.5	93 41.0	149 7 40.0	-121					
12 12	293 10.7	47 05.2	-17 35.5	293 29.7	- 0 30.8	176 03.8	+21 31.5	65 33.8	-15 26.5	108 14.9	150 - 7 52.1	-121					
13 13	308 13.2	62 05.3	36.0	308 30.6	30.0	191 06.7	31.5	80 36.1	26.6	122 48.9	149 8 04.2	-121					
14 14	323 15.6	77 05.4	36.4	323 31.4	29.2	206 09.5	31.6	95 38.4	26.6	137 22.8	150 8 16.3	-120					
15 15	338 18.1	92 05.5	.. 36.8	338 32.2	.. 28.5	221 12.3	.. 31.7	110 40.6	.. 26.7	151 56.8	149 8 28.3	-120					
16 16	353 20.6	107 05.5	37.2	353 33.1	27.7	236 15.1	31.7	125 42.9	26.7	166 30.7	150 8 40.3	-119					
17 17	8 23.0	122 05.6	37.6	8 33.9	27.0	251 17.9	31.8	140 45.2	26.7	181 04.7	149 8 52.2	-119					
18 18	23 25.5	137 05.7	-17 38.0	23 34.8	- 0 26.2	266 20.7	+21 31.9	155 47.5	-15 26.8	195 38.6	149 - 9 04.1	-119					
19 19	38 28.0	152 05.8	38.4	38 35.6	25.5	281 23.6	31.9	170 49.8	26.8	210 12.5	149 9 16.0	-117					
20 20	53 30.4	167 05.8	38.9	53 36.4	24.7	296 26.4	32.0	185 52.0	26.9	224 46.4	150 9 27.7	-118					
21 21	68 32.9	182 05.9	.. 39.3	68 37.3	.. 24.0	311 29.2	.. 32.1	200 54.3	.. 26.9	239 20.4	149 9 39.5	-117					
22 22	83 35.3	197 06.0	39.7	83 38.1	23.2	326 32.0	32.1	215 56.6	26.9	253 54.3	149 9 51.2	-116					
23 23	98 37.8	212 06.1	40.1	98 39.0	22.4	341 34.8	32.2	230 58.9	27.0	268 28.2	148 10 02.8	-116					
15 0	113 40.3	227 06.1	-17 40.5	113 39.8	- 0 21.7	356 37.7	+21 32.3	246 01.2	-15 27.0	283 02.0	149 -10 14.4	-115					
1 1	128 42.7	242 06.2	40.9	128 40.6	20.9	11 40.5	32.3	261 03.5	27.1	297 35.9	149 10 25.9	-115					
2 2	143 45.2	257 06.3	41.4	143 41.5	20.2	26 43.3	32.4	276 05.7	27.1	312 09.8	148 10 37.4	-115					
3 3	158 47.7	272 06.3	.. 41.8	158 42.3	.. 19.4	41 46.1	.. 32.5	291 08.0	.. 27.1	326 43.6	149 10 48.9	-113					
4 4	173 50.1	287 06.4	42.2	173 43.1	18.7	56 48.9	32.5	306 10.3	27.2	341 17.5	148 11 00.2	-114					
5 5	188 52.6	302 06.5	42.6	188 44.0	17.9	71 51.8	32.6	321 12.6	27.2	355 51.3	148 11 11.6	-112					
6 6	203 55.1	317 06.5	-17 43.0	203 44.8	- 0 17.2	86 54.6	+21 32.7	336 14.9	-15 27.3	10 25.1	148 -11 22.8	-113					
7 7	218 57.5	332 06.6	43.4	218 45.7	16.4	101 57.4	32.7	351 17.1	27.3	24 58.9	148 11 34.1	-111					
8 8	234 00.0	347 06.7	43.8	233 46.5	15.6	117 00.2	32.8	6 19.4	27.4	39 32.7	148 11 45.2	-111					
9 9	249 02.5	2 06.7	.. 44.3	248 47.3	.. 14.9	132 03.0	.. 32.9	21 21.7	.. 27.4	54 06.5	147 11 56.3	-111					
10 10	264 04.9	17 06.8	44.7	263 48.2	14.1	147 05.8	32.9	36 24.0	27.4	68 40.2	147 12 07.4	-110					
11 11	279 07.4	32 06.8	45.1	278 49.0	13.4	162 08.7	33.0	51 26.3	27.5	83 13.9	147 12 18.4	-109					
12 12	294 09.8	47 06.9	-17 45.5	293 49.8	- 0 12.6	177 11.5	+21 33.1	66 28.6	-15 27.5	97 47.6	147 -12 29.3	-109					
13 13	309 12.3	62 06.9	45.9	308 50.7	11.9	192 14.3	33.1	81 30.8	27.6	112 21.3	147 12 40.2	-108					
14 14	324 14.8	77 07.0	46.3	323 51.5	11.1	207 17.1	33.2	96 33.1	27.6	126 55.0	146 12 51.0	-108					
15 15	339 17.2	92 07.1	.. 46.7	338 52.4	.. 10.4	222 19.9	.. 33.3	111 35.4	.. 27.6	141 28.6	147 13 01.8	-106					
16 16	354 19.7	107 07.1	47.1	353 53.2	09.6	237 22.8	33.3	126 37.7	27.7	156 02.3	145 13 12.4	-107					
17 17	9 22.2	122 07.2	47.6	8 54.0	08.8	252 25.6	33.4	141 40.0	27.7	170 35.8	146 13 23.1	-106					
18 18	24 24.6	137 07.2	-17 48.0	23 54.9	- 0 08.1	267 28.4	+21 33.5	156 42.3	-15 27.8	185 09.4	146 -13 33.7	-105					
19 19	39 27.1	152 07.3	48.4	38 55.7	07.3	282 31.2	33.5	171 44.6	27.8	199 43.0	145 13 44.2	-104					
20 20	54 29.6	167 07.3	48.8	53 56.6	06.6	297 34.0	33.6	186 46.8	27.8	214 16.5	145 13 54.6	-104					
21 21	69 32.0	182 07.3	.. 49.2	68 57.4	.. 05.8	312 36.9	.. 33.7	201 49.1	.. 27.9	228 50.0	145 14 05.0	-103					
22 22	84 34.5	197 07.4	49.6	83 58.2	05.1	327 39.7	33.7	216 51.4	27.9	243 23.5	144 14 15.3	-103					
23 23	99 37.0	212 07.4	50.0	98 59.1	04.3	342 42.5	33.8	231 53.7	28.0	257 56.9	144 14 25.6	-102					
24 24	114 39.4	227 07.5	-17 50.4	113 59.9	- 0 03.6	357 45.3	+21 33.9	246 56.0	-15 28.0	272 30.3	144 -14 35.8	-101					
code	-	+ 1 - 5	+ 9 + 8	+ 29 0	+ 23 - 1												

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS			
	GHA	Dec.	No.	Name	SHA	Dec.				13	14	15	16				
	h	°			°					h m	h m	h m	h m	Alt.	Sun's Low'r Limb Add	Venus Add	Mars Add
13	0	177 54.5	-21 38.7	7 Acamar	315 51.3	-40 29.2	72	6 39	6 39	23 33	25 32	1 32	3 47				
1	1	192 54.2	38.3	5 Achernar	335 59.1	-57 28.1	70	6 34	6 34	23 25	25 13	1 13	3 09				
2	2	207 54.0	37.9	30 Acrux	173 58.2	-62 50.9	68	10 41	6 29	23 19	24 59	0 59	2 43				
3	3	222 53.8	37.0	19 Adhara	255 46.5	-28 54.7	66	9 58	6 25	23 13	24 48	0 48	2 23				
4	4	237 53.5	37.4	10 Aldebaran	291 39.4	+16 25.3	64	9 29	6 21	23 09	24 38	0 38	2 08	0			
5	5	252 53.3	36.6				62	9 08	6 16	23 05	24 30	0 30	1 55	30	0.6	0.2	0.1
6	6	267 53.1	-21 36.2	32 Alioth	166 58.8	+56 11.8	60	8 50	6 13	23 01	24 23	0 23	1 44	45	0.6	0.2	0.1
7	7	282 52.8	35.8	34 Alkaid	153 33.3	+49 31.8	58	8 36	6 10	22 59	24 17	0 17	1 34	60	0.6	0.1	0.0
8	8	297 52.6	35.4	55 Al Na'ir	28 38.9	-47 10.9	56	8 23	6 06	22 56	24 11	0 11	1 26	75	0.6	0.1	0.0
9	9	312 52.3	35.0	15 Anilam	276 30.5	-1 13.8	54	8 12	6 03	22 54	24 07	0 07	1 18	90	0.6	0.0	0.0
10	10	327 52.1	34.6	25 Alphard	218 38.8	-8 27.9	52	8 03	6 00	22 51	24 02	0 02	1 12				
11	11	342 51.9	34.1				50	7 54	5 58	22 49	23 58	25 06	1 06				
12	12	357 51.6	-21 33.7	41 Alphecca	126 48.2	+26 51.6	45	7 36	5 51	22 45	23 50	24 53	0 53	Moon's Lower Limb			
13	13	12 51.4	33.3	1 Alpheratz	358 29.0	+28 50.8	40	7 21	5 45	22 42	23 43	24 43	0 43	Add			
14	14	27 51.2	32.9	51 Altair	62 51.2	+8 44.9	35	7 08	5 39	22 39	23 37	24 34	0 34	Alt.	13	14	15
15	15	42 50.9	32.5	2 Ankaa	353 58.9	-42 33.1	30	6 57	5 33	22 36	23 31	24 26	0 26	0			
16	16	57 50.7	32.0	42 Antares	113 20.2	-26 20.0	20	6 38	5 20	22 31	23 22	24 13	0 13	4	14.3	13.4	12.8
17	17	72 50.4	31.6				10	6 21	5 07	22 28	23 14	24 01	0 01	8	14.3	13.4	12.8
18	18	87 50.2	-21 31.2	37 Arcturus	146 35.7	+19 24.7	0	6 05	4 51	22 24	23 07	23 50	24 35	12	14.3	13.4	12.8
19	19	102 50.0	30.8	43 Atria	109 01.9	-68 56.7	10	5 49	4 33	22 20	22 59	23 39	24 21	16	14.3	13.4	12.8
20	20	117 49.7	30.4	22 Avior	234 35.4	-59 21.9	20	5 32	4 09	22 16	22 52	23 28	24 06	20	14.3	13.5	12.9
21	21	132 49.5	29.9	13 Bellatrix	279 18.7	+6 18.6	30	5 12	3 37	22 12	22 43	23 15	23 49	24	14.4	13.5	12.9
22	22	147 49.3	29.5	16 Betelgeuse	271 48.4	+7 24.0	35	5 00	3 16	22 09	22 38	23 07	23 40	28	14.4	13.6	13.0
23	23	162 49.0	29.1				40	4 47	2 49	22 07	22 32	22 59	23 29	32	14.4	13.6	13.0
14	0	177 48.8	-21 28.7	17 Canopus	264 15.1	-52 40.3	45	4 31	2 09	22 03	22 25	22 49	23 16	36	14.4	13.7	13.1
1	1	192 48.6	28.2	12 Capella	281 38.8	+45 57.4	50	4 11	0 46	22 00	22 18	22 37	23 00	40	14.5	13.7	13.2
2	2	207 48.3	27.8	53 Deneb	50 01.8	+45 07.2	52	4 01	0 00	21 58	22 14	22 32	22 53	44	14.5	13.8	13.3
3	3	222 48.1	27.4	28 Denebola	183 18.1	+14 49.2	54	3 50	0 00	21 56	22 10	22 26	22 44	48	14.6	13.9	13.4
4	4	237 47.9	26.9	4 Diphda	349 39.8	-18 14.0	56	3 38	0 00	21 54	22 06	22 19	22 35	52	14.6	14.0	13.5
5	5	252 47.6	26.5				58	3 24	0 00	21 51	22 01	22 11	22 25	56	14.7	14.1	13.7
6	6	267 47.4	-21 26.1	27 Dubhe	194 44.7	+61 59.3	60	3 07	0 00	21 49	21 55	22 03	22 13	60	14.7	14.2	13.8
7	7	282 47.2	25.7	14 Elnath	279 07.6	+28 34.3	S							64	14.8	14.3	13.9
8	8	297 46.9	25.2	47 Eltanin	91 07.0	+51 29.5								68	14.9	14.4	14.1
9	9	312 46.7	24.8	54 Enif	34 30.4	+9 40.2								72	14.9	14.5	14.2
10	10	327 46.5	24.4	56 Fomalhaut	16 12.4	-29 51.7								76	15.0	14.6	14.3
11	11	342 46.2	23.9				N	h m	h m	h m	h m	h m	h m	80	15.1	14.7	14.5
12	12	357 46.0	-21 23.5	31 Gacrux	172 49.7	-56 51.6	72	17 39	17 39	9 31	9 08	8 40	7 57	84	15.1	14.9	14.6
13	13	12 45.8	23.1	29 Gienah	176 37.3	-17 17.6	70	17 45	17 45	9 34	9 18	9 00	8 35	88	15.2	15.0	14.8
14	14	27 45.6	22.6	35 Hadar	149 50.3	-60 09.3	68	13 37	17 50	9 37	9 27	9 16	9 03	90	15.3	15.1	14.9
15	15	42 45.3	22.2	6 Hamal	328 50.2	+23 15.2	66	14 20	17 54	9 39	9 34	9 29	9 23		Add to table, back cover		
16	16	57 45.1	21.8	48 Kaus Aust.	84 42.2	-34 24.5	64	14 49	17 59	9 41	9 40	9 40	9 40		Moon's Upper Limb		
17	17	72 44.9	21.3				62	15 11	18 03	9 43	9 46	9 49	9 54		Subtract		
18	18	87 44.6	-21 20.9	40 Kochab	137 18.2	+74 19.9	60	15 28	18 06	9 44	9 50	9 57	10 06	Alt.	13	14	15
19	19	102 44.4	20.4	57 Markab	14 22.2	+14 57.9	58	15 43	18 10	9 45	9 54	10 04	10 16	0			
20	20	117 44.2	20.0	8 Menkar	315 00.7	+3 54.9	56	15 55	18 12	9 46	9 58	10 10	10 25	4	16.3	16.8	17.2
21	21	132 44.0	19.6	36 Menkent	148 59.3	-36 08.9	54	16 06	18 15	9 47	10 01	10 16	10 33	8	16.3	16.8	17.1
22	22	147 43.7	19.1	24 Miapl'dus	221 48.3	-69 31.9	52	16 16	18 18	9 48	10 04	10 21	10 40	12	16.2	16.7	17.1
23	23	162 43.5	18.7				50	16 24	18 20	9 50	10 07	10 26	10 47	16	16.2	16.7	17.0
15	0	177 43.3	-21 18.2	9 Mirfak	309 42.9	+49 42.4	45	16 43	18 28	9 51	10 13	10 36	11 01	20	16.2	16.7	17.0
1	1	192 43.0	17.8	50 Nunki	76 52.9	-26 21.3	40	16 57	18 33	9 53	10 18	10 44	11 12	24	16.2	16.6	16.9
2	2	207 42.8	17.3	52 Peacock	54 28.6	-56 52.9	35	17 10	18 39	9 54	10 22	10 51	11 22	28	16.1	16.6	16.9
3	3	222 42.6	16.9	21 Pollux	244 20.8	+28 08.1	30	17 21	18 45	9 56	10 26	10 58	11 31	32	16.1	16.5	16.8
4	4	237 42.4	16.4	20 Procyon	245 45.2	+5 20.4	20	17 40	18 58	9 58	10 33	11 09	11 46	36	16.1	16.4	16.7
5	5	252 42.1	16.0				10	17 57	19 11	10 00	10 39	11 18	11 59	40	16.0	16.4	16.6
6	6	267 41.9	-21 15.6	46 R'alhague	96 47.4	+12 35.4	0	18 13	19 27	10 01	10 44	11 28	12 11	44	16.0	16.3	16.5
7	7	282 41.7	15.1	26 Regulus	208 29.8	+12 11.1	10	18 28	19 44	10 03	10 50	11 37	12 24	48	15.9	16.2	16.4
8	8	297 41.5	14.7	11 Rigel	281 53.8	-8 15.2	20	18 45	20 07	10 05	10 56	11 47	12 37	52	15.8	16.0	16.1
9	9	312 41.2	14.2	38 Rigil Kent.	140 51.9	-60 39.0	30	19 05	20 39	10 07	11 03	11 58	12 52	56	15.7	15.9	16.0
10	10	327 41.0	13.8	44 Sabik	103 03.0	-15 40.3	35	19 17	21 00	10 08	11 07	12 04	13 01	60	15.6	15.7	15.7
11	11	342 40.8	13.3				40	19 30	21 27	10 10	11 11	12 12	13 12	64	15.5	15.6	15.6
12	12	357 40.6	-21 12.9	3 Schedar	350 30.7	+56 17.8	45	19 46	22 06	10 11	11 16	12 20	13 24	68	15.4	15.3	15.3
13	13	12 40.3	12.4	45 Shaula	97 21.7	-37 04.3	50	20 06	23 24	10 13	11 23	12 31	13 38	80	15.3	15.2	15.1
14	14	27 40.1	12.0	18 Sirius	259 11.9	-16 39.3	52	20 16	0 00	10 14	11 25	12 36	13 45	84	15.3	15.1	15.0
15	15	42 39.9	11.5	33 Spica	159 17.4	-10 55.7	54	20 26	0 00	10 15	11 29	12 41	13 53	88	15.3	15.1	15.0
16	16	57 39.7	11.0	23 Suhail	223 24.3	-43 15.0	56	20 39	0 00	10 16	11 32	12 47	14 01	90	15.3	15.1	15.0
17	17	72 39.4	10.6				58	20 52	0 00	10 17	11 36	12 54	14 11		Subtract from table, back cover		
18	18	87 39.2	-21 10.1	49 Vega	81 09.0	+38 44.4	60	21 09	0 00	10 18	11 40	13 02	14 22		Last Quarter		
19	19	102 39.0	09.7	39 Zub'g'bi	137 54.0	-15 51.4	S								15		
20	20	117 38.8	09.2														
21	21	132 38.6	08.8														
22	22	147 38.3	08.3														
23	23	162 38.1	07.8														
24	24	177 3															

G M T	VENUS -4.2		MARS 1.0		JUPITER -2.2		SATURN 0.8		MOON				
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code	
h	°	'	°	'	°	'	°	'	°	'	°	'	
16	0	114 39.4	227 07.5	-17 50.4	113 59.9	- 0 03.6	357 45.3	+21 33.9	246 56.0	-15 28.0	272 30.3	144 -14 35.8	-101
	1	129 41.9	242 07.5	50.8	129 00.7	02.8	12 48.1	33.9	261 58.3	28.1	287 03.7	144 14 45.9	-101
	2	144 44.3	257 07.6	51.3	144 01.6	02.0	27 51.0	34.0	277 00.5	28.1	301 37.1	143 14 56.0	-100
	3	159 46.8	272 07.6	.. 51.7	159 02.4	.. 01.3	42 53.8	.. 34.1	292 02.8	.. 28.1	316 10.4	143 -15 06.0	-99
	4	174 49.3	287 07.6	52.1	174 03.3	- 0 00.5	57 56.6	34.1	307 05.1	28.2	330 43.7	143 15 15.9	-98
	5	189 51.7	302 07.7	52.5	189 04.1	+ 0 00.2	72 59.4	34.2	322 07.4	28.2	345 17.0	142 15 25.7	-98
	6	204 54.2	317 07.7	-17 52.9	204 04.9	+ 0 01.0	88 02.2	+21 34.3	337 09.7	-15 28.3	359 50.2	142 -15 35.5	-98
	7	219 56.7	332 07.7	53.3	219 05.8	01.7	103 05.0	34.3	352 12.0	28.3	14 23.4	142 15 45.3	-96
	8	234 59.1	347 07.8	53.7	234 06.6	02.5	118 07.9	34.4	7 14.3	28.3	28 56.6	141 15 54.9	-96
	9	250 01.6	2 07.8	.. 54.1	249 07.5	.. 03.2	133 10.7	.. 34.5	22 16.5	.. 28.4	43 29.7	141 -16 04.5	-95
	10	265 04.1	17 07.8	54.5	264 08.3	04.0	148 13.5	34.5	37 18.8	28.4	58 02.8	141 16 14.0	-94
	11	280 06.5	32 07.9	54.9	279 09.1	04.8	163 16.3	34.6	52 21.1	28.5	72 35.9	140 16 23.4	-94
	12	295 09.0	47 07.9	-17 55.4	294 10.0	+ 0 05.5	178 19.1	+21 34.7	67 23.4	-15 28.5	87 08.9	140 -16 32.8	-93
	13	310 11.4	62 07.9	55.8	309 10.8	06.3	193 22.0	34.7	82 25.7	28.5	101 41.9	140 16 42.1	-92
	14	325 13.9	77 07.9	56.2	324 11.6	07.0	208 24.8	34.8	97 28.0	28.6	116 14.9	139 16 51.3	-92
	15	340 16.4	92 08.0	.. 56.6	339 12.5	.. 07.8	223 27.6	.. 34.9	112 30.3	.. 28.6	130 47.8	139 -17 00.5	-90
	16	355 18.8	107 08.0	57.0	354 13.3	08.5	238 30.4	34.9	127 32.6	28.7	145 20.7	139 17 09.5	-90
	17	10 21.3	122 08.0	57.4	9 14.2	09.3	253 33.2	35.0	142 34.8	28.7	159 53.6	138 17 18.5	-90
	18	25 23.8	137 08.0	-17 57.8	24 15.0	+ 0 10.0	268 36.1	+21 35.1	157 37.1	-15 28.7	174 26.4	138 -17 27.5	-88
	19	40 26.2	152 08.0	58.2	39 15.8	10.8	283 38.9	35.1	172 39.4	28.8	188 59.2	137 17 36.3	-88
	20	55 28.7	167 08.1	58.6	54 16.7	11.5	298 41.7	35.2	187 41.7	28.8	203 31.9	137 17 45.1	-87
	21	70 31.2	182 08.1	.. 59.0	69 17.5	.. 12.3	313 44.5	.. 35.2	202 44.0	.. 28.9	218 04.6	137 -17 53.8	-86
	22	85 33.6	197 08.1	59.4	84 18.4	13.1	328 47.3	35.3	217 46.3	28.9	232 37.3	136 18 02.4	-85
	23	100 36.1	212 08.1	17 59.8	99 19.2	13.8	343 50.1	35.4	232 48.6	28.9	247 09.9	136 18 10.9	-85
17	0	115 38.6	227 08.1	-18 00.2	114 20.0	+ 0 14.6	358 53.0	+21 35.4	247 50.9	-15 29.0	261 42.5	135 -18 19.4	-84
	1	130 41.0	242 08.1	00.7	129 20.9	15.3	13 55.8	35.5	262 53.1	29.0	276 15.0	135 18 27.8	-82
	2	145 43.5	257 08.1	01.1	144 21.7	16.1	28 58.6	35.6	277 55.4	29.0	290 47.5	135 18 36.0	-83
	3	160 45.9	272 08.2	.. 01.5	159 22.6	.. 16.8	44 01.4	.. 35.6	292 57.7	.. 29.1	305 20.0	134 -18 44.3	-81
	4	175 48.4	287 08.2	01.9	174 23.4	17.6	59 04.2	35.7	308 00.0	29.1	319 52.4	134 18 52.4	-80
	5	190 50.9	302 08.2	02.3	189 24.2	18.3	74 07.1	35.8	323 02.3	29.2	334 24.8	133 19 00.4	-80
	6	205 53.3	317 08.2	-18 02.7	204 25.1	+ 0 19.1	89 09.9	+21 35.8	338 04.6	-15 29.2	348 57.1	133 -19 08.4	-79
	7	220 55.8	332 08.2	03.1	219 25.9	19.8	104 12.7	35.9	353 06.9	29.2	3 29.4	132 19 16.3	-78
	8	235 58.3	347 08.2	03.5	234 26.7	20.6	119 15.5	36.0	8 09.2	29.3	18 01.6	132 19 24.1	-77
	9	251 00.7	2 08.2	.. 03.9	249 27.6	.. 21.4	134 18.3	.. 36.0	23 11.5	.. 29.3	32 33.8	132 -19 31.8	-77
	10	266 03.2	17 08.2	04.3	264 28.4	22.1	149 21.2	36.1	38 13.7	29.4	47 06.0	131 19 39.5	-75
	11	281 05.7	32 08.2	04.7	279 29.3	22.9	164 24.0	36.2	53 16.0	29.4	61 38.1	131 19 47.0	-75
	12	296 08.1	47 08.2	-18 05.1	294 30.1	+ 0 23.6	179 26.8	+21 36.2	68 18.3	-15 29.4	76 10.2	130 -19 54.5	-73
	13	311 10.6	62 08.2	05.5	309 30.9	24.4	194 29.6	36.3	83 20.6	29.5	90 42.2	130 20 01.8	-73
	14	326 13.1	77 08.2	05.9	324 31.8	25.1	209 32.4	36.4	98 22.9	29.5	105 14.2	129 20 09.1	-72
	15	341 15.5	92 08.2	.. 06.3	339 32.6	.. 25.9	224 35.3	.. 36.4	113 25.2	.. 29.6	119 46.1	129 -20 16.3	-71
	16	356 18.0	107 08.2	06.7	354 33.5	26.6	239 38.1	36.5	128 27.5	29.6	134 18.0	128 20 23.4	-70
	17	11 20.4	122 08.2	07.1	9 34.3	27.4	254 40.9	36.6	143 29.8	29.6	148 49.8	128 20 30.4	-70
	18	26 22.9	137 08.2	-18 07.5	24 35.1	+ 0 28.1	269 43.7	+21 36.6	158 32.1	-15 29.7	163 21.6	128 -20 37.4	-68
	19	41 25.4	152 08.2	07.9	39 36.0	28.9	284 46.5	36.7	173 34.4	29.7	177 53.4	127 20 44.2	-68
	20	56 27.8	167 08.2	08.3	54 36.8	29.7	299 49.3	36.8	188 36.7	29.7	192 25.1	127 20 51.0	-66
	21	71 30.3	182 08.1	.. 08.7	69 37.6	.. 30.4	314 52.2	.. 36.8	203 38.9	.. 29.8	206 56.8	126 -20 57.6	-66
	22	86 32.8	197 08.1	09.1	84 38.5	31.2	329 55.0	36.9	218 41.2	29.8	221 28.4	126 21 04.2	-64
	23	101 35.2	212 08.1	09.5	99 39.3	31.9	344 57.8	36.9	233 43.5	29.9	236 00.0	125 21 10.6	-64
18	0	116 37.7	227 08.1	-18 09.9	114 40.2	+ 0 32.7	0 00.6	+21 37.0	248 45.8	-15 29.9	250 31.5	125 -21 17.0	-63
	1	131 40.2	242 08.1	10.3	129 41.0	33.4	15 03.4	37.1	263 48.1	29.9	265 03.0	124 21 23.3	-62
	2	146 42.6	257 08.1	10.7	144 41.8	34.2	30 06.3	37.1	278 50.4	30.0	279 34.4	124 21 29.5	-61
	3	161 45.1	272 08.1	.. 11.1	159 42.7	.. 34.9	45 09.1	.. 37.2	293 52.7	.. 30.0	294 05.8	124 -21 35.6	-60
	4	176 47.5	287 08.0	11.5	174 43.5	35.7	60 11.9	37.3	308 55.0	30.1	308 37.2	123 21 41.6	-59
	5	191 50.0	302 08.0	11.9	189 44.4	36.4	75 14.7	37.3	323 57.3	30.1	323 08.5	122 21 47.5	-58
	6	206 52.5	317 08.0	-18 12.3	204 45.2	+ 0 37.2	90 17.5	+21 37.4	338 59.6	-15 30.1	337 39.7	122 -21 53.3	-57
	7	221 54.9	332 08.0	12.7	219 46.0	37.9	105 20.4	37.5	354 01.9	30.2	352 10.9	122 21 59.0	-56
	8	236 57.4	347 08.0	13.1	234 46.9	38.7	120 23.2	37.5	9 04.2	30.2	6 42.1	121 22 04.6	-55
	9	251 59.9	2 07.9	.. 13.5	249 47.7	.. 39.5	135 26.0	.. 37.6	24 06.5	.. 30.2	21 13.2	121 -22 10.1	-54
	10	267 02.3	17 07.9	13.9	264 48.6	40.2	150 28.8	37.7	39 08.7	30.3	35 44.3	120 22 15.5	-53
	11	282 04.8	32 07.9	14.3	279 49.4	41.0	165 31.6	37.7	54 11.0	30.3	50 15.3	120 22 20.8	-53
	12	297 07.3	47 07.9	-18 14.7	294 50.2	+ 0 41.7	180 34.4	+21 37.8	69 13.3	-15 30.4	64 46.3	120 -22 26.1	-51
	13	312 09.7	62 07.8	15.1	309 51.1	42.5	195 37.3	37.9	84 15.6	30.4	79 17.3	119 22 31.2	-50
	14	327 12.2	77 07.8	15.5	324 51.9	43.2	210 40.1	37.9	99 17.9	30.4	93 48.2	118 22 36.2	-49
	15	342 14.7	92 07.8	.. 15.9	339 52.7	.. 44.0	225 42.9	.. 38.0	114 20.2	.. 30.5	108 19.0	118 -22 41.1	-48
	16	357 17.1	107 07.7	16.3	354 53.6	44.7	240 45.7	38.1	129 22.5	30.5	122 49.8	118 22 45.9	-47
	17	12 19.6	122 07.7	16.7	9 54.4	45.5	255 48.5	38.1	144 24.8	30.5	137 20.6	117 22 50.6	-46
	18	27 22.0	137 07.7	-18 17.1	24 55.3	+ 0 46.2	270 51.4	+21 38.2	159 27.1	-15 30.6	151 51.3	117 -22 55.2	-45
	19	42 24.5	152 07.6	17.5	39 56.1	47.0	285 54.2	38.2	174 29.4	30.6	166 22.0	117 22 59.7	-44
	20	57 27.0	167 07.6	17.9	54 56.9	47.7	300 57.0	38.3	189 31.7	30.7	180 52.7	116 23 04.1	-43
	21	72 29.4	182 07.6	.. 18.3	69 57.8	.. 48.5	315 59.8	.. 38.4	204 34.0	.. 30.7	195 23.3	115 -23 08.4	-41
	22	87 31.9	197 07.5	18.7	84 58.6	49.2	331 02.6	38.4	219 36.3	30.7	209 53.8	115 23 12.5	-41
	23	102 34.4	212 07.5	19.1	99 59.5	50.0	346 05.4	38.5	234 38.6	30.8	224 24.3	115 23 16.6	-40
24	117 36.8	227 07.5	-18 19.5	115 00.3	+ 0 50.8	1 08.3	+21 38.6	249 40.9	-15 30.8	238 54.8	114 -23 20.6	-38	
code	-	0	- 4	+ 8	+ 8	+ 28	+ 1	+ 23	- 1				

G M T	SUN		STARS		Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS						
	GHA	Dec.	No.	Name SHA				Dec.	16	17	18	19	Sun's Lower Limb Add	Venus Add	Mars Add			
	h	m	N	h				m	h	m	h	m				h	m	
16	177 37.9	-21 07.4	7	Acamar	315 51.3	-40 29.2	72	6 34	3 47	5 35	5 35	5 35	5 35	5 35	Alt.			
0	192 37.7	06.9	5	Achernar	335 59.2	-57 28.1	70	12 02	6 28	3 09	5 35	5 35	5 35	5 35				
1	207 37.5	06.5	30	Acrux	173 58.2	-62 50.9	68	10 27	6 26	2 43	4 37	4 37	4 37	4 37				
2	222 37.2	06.0	19	Adhara	255 46.5	-28 54.7	66	9 49	6 21	2 23	4 03	5 49	7 57	7 57				
3	237 37.0	05.5	10	Aldebaran	291 39.4	+16 25.3	64	9 23	6 17	2 08	3 39	5 10	6 37	6 37				
4	252 36.8	05.1					62	9 02	6 14	1 55	3 19	4 43	6 01	6 01				
5	267 36.6	-21 04.6	32	Alioth	166 58.8	+56 11.8	60	8 46	6 10	1 44	3 04	4 22	5 34	5 34				
6	282 36.4	04.1	34	Alkaid	153 33.2	+49 31.8	58	8 32	6 07	1 34	2 51	4 05	5 14	5 14				
7	297 36.1	03.7	55	Al Na'ir	28 38.9	-47 10.9	56	8 20	6 05	1 26	2 39	3 51	4 57	4 57				
8	312 35.9	03.2	15	Alnilam	276 30.5	-1 13.8	54	8 09	6 01	1 18	2 29	3 38	4 43	4 43				
9	327 35.7	02.7	25	Alphard	128 38.8	-8 27.9	52	8 00	5 59	1 12	2 21	3 27	4 30	4 30				
10	342 35.5	02.3					50	7 52	5 57	1 06	2 13	3 18	4 19	4 19				
11	357 35.3	-21 01.8	41	Alphecca	226 48.2	+26 51.6	45	7 34	5 51	0 53	1 56	2 57	3 56	3 56				
12	12 35.1	01.3	1	Alpheratz	358 29.0	+28 50.8	40	7 20	5 44	0 43	1 42	2 41	3 38	3 38				
13	27 34.8	00.9	51	Altair	62 51.2	+8 44.9	35	7 07	5 39	0 34	1 31	2 27	3 23	3 23				
14	42 34.6	-21 00.4	2	Ankaa	353 58.9	-42 33.1	30	6 57	5 33	0 26	1 21	2 15	3 09	3 09				
15	57 34.4	20 59.9	42	Antares	113 20.2	-26 20.0	20	6 38	5 21	0 13	1 04	1 55	2 47	2 47				
16	72 34.2	59.5					10	6 22	5 07	0 01	0 49	1 37	2 27	2 27				
17	87 34.0	-20 59.0	37	Arcturus	146 35.7	+19 24.7	0	6 06	4 52	24 35	0 35	1 21	2 09	2 09				
18	102 33.8	58.5	43	Atria	109 01.8	-68 56.7	10	5 51	4 34	24 21	0 21	1 04	1 51	1 51				
19	117 33.5	58.0	22	Avior	234 35.4	-59 21.9	20	5 34	4 11	24 06	0 06	0 47	1 32	1 32				
20	132 33.3	57.6	13	Bellatrix</														

G M T	T	VENUS -4.1		MARS 1.1		JUPITER -2.2		SATURN 0.8		MOON			
		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
19	h	°	'	°	'	°	'	°	'	°	'	°	'
0	117 36.8	227 07.5	-18 19.5	115 00.3	+ 0 50.8	1 08.3	+21 38.6	249 40.9	-15 30.8	238 54.8	114	-23 20.6	-38
1	132 39.3	242 07.4	19.9	130 01.1	51.5	16 11.1	38.6	264 43.2	30.8	253 25.2	114	23 24.4	-38
2	147 41.8	257 07.4	20.2	145 02.0	52.3	31 13.9	38.7	279 45.5	30.9	267 55.6	114	23 28.2	-36
3	162 44.2	272 07.3	20.6	160 02.8	53.0	46 16.7	38.8	294 47.8	30.9	282 26.0	113	23 31.8	-36
4	177 46.7	287 07.3	21.0	175 03.7	53.8	61 19.5	38.8	309 50.0	31.0	296 56.3	113	23 35.4	-34
5	192 49.2	302 07.2	21.4	190 04.5	54.5	76 22.4	38.9	324 52.3	31.0	311 26.6	112	23 38.8	-33
6	207 51.6	317 07.2	-18 21.8	205 05.3	+ 0 55.3	91 25.2	+21 39.0	339 54.6	-15 31.0	325 56.8	112	-23 42.1	-32
7	222 54.1	332 07.1	22.2	220 06.2	56.0	106 28.0	39.0	354 56.9	31.1	340 27.0	111	23 45.3	-31
8	237 56.5	347 07.1	22.6	235 07.0	56.8	121 30.8	39.1	9 59.2	31.1	354 57.1	112	23 48.4	-30
9	252 59.0	2 07.0	23.0	250 07.8	57.5	136 33.6	39.2	25 01.5	31.1	9 27.3	110	23 51.4	-29
10	268 01.5	17 07.0	23.4	265 08.7	58.3	151 36.4	39.2	40 03.8	31.2	23 57.3	111	23 54.3	-27
11	283 03.9	32 06.9	23.8	280 09.5	59.0	166 39.3	39.3	55 06.1	31.2	38 27.4	110	23 57.0	-27
12	298 06.4	47 06.9	-18 24.2	295 10.4	+ 0 59.8	181 42.1	+21 39.3	70 08.4	-15 31.3	52 57.4	110	-23 59.7	-25
13	313 08.9	62 06.8	24.6	310 11.2	1 00.5	196 44.9	39.4	85 10.7	31.3	67 27.4	109	24 02.2	-24
14	328 11.3	77 06.8	24.9	325 12.0	01.3	211 47.7	39.5	100 13.0	31.3	81 57.3	109	24 04.6	-23
15	343 13.8	92 06.7	25.3	340 12.9	02.0	226 50.5	39.5	115 15.3	31.4	96 27.2	109	24 06.9	-22
16	358 16.3	107 06.7	25.7	355 13.7	02.8	241 53.4	39.6	130 17.6	31.4	110 57.1	108	24 09.1	-21
17	13 18.7	122 06.6	26.1	10 14.6	03.5	256 56.2	39.7	145 19.9	31.4	125 26.9	109	24 11.2	-20
18	28 21.2	137 06.6	-18 26.5	25 15.4	+ 1 04.3	271 59.0	+21 39.7	160 22.2	-15 31.5	139 56.8	107	-24 13.2	-18
19	43 23.7	152 06.5	26.9	40 16.2	05.1	287 01.8	39.8	175 24.5	31.5	154 26.5	108	24 15.0	-18
20	58 26.1	167 06.4	27.3	55 17.1	05.8	302 04.6	39.9	190 26.8	31.5	168 56.3	107	24 16.8	-16
21	73 28.6	182 06.4	27.7	70 17.9	06.6	317 07.4	39.9	205 29.1	31.6	183 26.0	107	24 18.4	-15
22	88 31.0	197 06.3	28.0	85 18.8	07.3	332 10.3	40.0	220 31.4	31.6	197 55.7	107	24 19.9	-14
23	103 33.5	212 06.2	28.4	100 19.6	08.1	347 13.1	40.1	235 33.7	31.7	212 25.4	106	24 21.3	-12
20	0 118 36.0	227 06.2	-18 28.8	115 20.4	+ 1 08.8	2 15.9	+21 40.1	250 36.0	-15 31.7	226 55.0	106	-24 22.5	-12
1	133 38.4	242 06.1	29.2	130 21.3	09.6	17 18.7	40.2	265 38.3	31.7	241 24.6	106	24 23.7	-10
2	148 40.9	257 06.0	29.6	145 22.1	10.3	32 21.5	40.2	280 40.6	31.8	255 54.2	105	24 24.7	-9
3	163 43.4	272 06.0	30.0	160 22.9	11.1	47 24.3	40.3	295 42.9	31.8	270 23.7	105	24 25.6	-8
4	178 45.8	287 05.9	30.4	175 23.8	11.8	62 27.2	40.4	310 45.2	31.8	284 53.2	105	24 26.4	-7
5	193 48.3	302 05.8	30.7	190 24.6	12.6	77 30.0	40.4	325 47.5	31.9	299 22.7	105	24 27.1	-6
6	208 50.8	317 05.8	-18 31.1	205 25.5	+ 1 13.3	92 32.8	+21 40.5	340 49.8	-15 31.9	313 52.2	105	-24 27.7	-4
7	223 53.2	332 05.7	31.5	220 26.3	14.1	107 35.6	40.6	355 52.1	31.9	328 21.7	104	24 28.1	-3
8	238 55.7	347 05.6	31.9	235 27.1	14.8	122 38.4	40.6	10 54.4	32.0	342 51.1	104	24 28.4	-2
9	253 58.1	2 05.5	32.3	250 28.0	15.6	137 41.2	40.7	25 56.7	32.0	357 20.5	104	24 28.6	-1
10	269 00.6	17 05.5	32.7	265 28.8	16.3	152 44.1	40.8	40 59.0	32.1	11 49.9	104	24 28.7	0
11	284 03.1	32 05.4	33.1	280 29.7	17.1	167 46.9	40.8	56 01.3	32.1	26 19.3	104	24 28.7	2
12	299 05.5	47 05.3	-18 33.4	295 30.5	+ 1 17.8	182 49.7	+21 40.9	71 03.6	-15 32.1	40 48.7	103	-24 28.5	2
13	314 08.0	62 05.2	33.8	310 31.3	18.6	197 52.5	41.0	86 05.9	32.2	55 18.0	103	24 28.3	4
14	329 10.5	77 05.1	34.2	325 32.2	19.3	212 55.3	41.0	101 08.2	32.2	69 47.3	103	24 27.9	6
15	344 12.9	92 05.1	34.6	340 33.0	20.1	227 58.1	41.1	116 10.5	32.2	84 16.6	103	24 27.3	6
16	359 15.4	107 05.0	35.0	355 33.8	20.8	243 01.0	41.1	131 12.8	32.3	98 45.9	103	24 26.7	7
17	14 17.9	122 04.9	35.3	10 34.7	21.6	258 03.8	41.2	146 15.1	32.3	113 15.2	102	24 26.0	9
18	29 20.3	137 04.8	-18 35.7	25 35.5	+ 1 22.3	273 06.6	+21 41.3	161 17.4	-15 32.3	127 44.4	103	-24 25.1	10
19	44 22.8	152 04.7	36.1	40 36.4	23.1	288 09.4	41.3	176 19.7	32.4	142 13.7	102	24 24.1	11
20	59 25.3	167 04.6	36.5	55 37.2	23.8	303 12.2	41.4	191 22.0	32.4	156 42.9	103	24 23.0	13
21	74 27.7	182 04.6	36.9	70 38.0	24.6	318 15.0	41.5	206 24.3	32.4	171 12.2	102	24 21.7	14
22	89 30.2	197 04.5	37.2	85 38.9	25.3	333 17.9	41.5	221 26.6	32.5	185 41.4	102	24 20.3	14
23	104 32.6	212 04.4	37.6	100 39.7	26.1	348 20.7	41.6	236 28.9	32.5	200 10.6	102	24 18.9	17
21	0 119 35.1	227 04.3	-18 38.0	115 40.6	+ 1 26.9	3 23.5	+21 41.7	251 31.2	-15 32.5	214 39.8	102	-24 17.2	17
1	134 37.6	242 04.2	38.4	130 41.4	27.6	18 26.3	41.7	266 33.5	32.6	229 09.0	101	24 15.5	18
2	149 40.0	257 04.1	38.8	145 42.2	28.4	33 29.1	41.8	281 35.8	32.6	243 38.1	102	24 13.7	20
3	164 42.5	272 04.0	39.1	160 43.1	29.1	48 31.9	41.8	296 38.1	32.7	258 07.3	102	24 11.7	21
4	179 45.0	287 03.9	39.5	175 43.9	29.9	63 34.8	41.9	311 40.4	32.7	272 36.5	102	24 09.6	22
5	194 47.4	302 03.8	39.9	190 44.8	30.6	78 37.6	42.0	326 42.7	32.7	287 05.7	101	24 07.4	24
6	209 49.9	317 03.7	-18 40.3	205 45.6	+ 1 31.4	93 40.4	+21 42.0	341 45.0	-15 32.8	301 34.8	102	-24 05.0	24
7	224 52.4	332 03.6	40.6	220 46.4	32.1	108 43.2	42.1	356 47.3	32.8	316 04.0	101	24 02.6	26
8	239 54.8	347 03.5	41.0	235 47.3	32.9	123 46.0	42.2	11 49.6	32.8	330 33.1	102	24 00.0	27
9	254 57.3	2 03.4	41.4	250 48.1	33.6	138 48.8	42.2	26 51.9	32.9	345 02.3	102	23 57.3	28
10	269 59.8	17 03.3	41.8	265 48.9	34.4	153 51.7	42.3	41 54.2	32.9	359 31.5	101	23 54.5	30
11	285 02.2	32 03.2	42.1	280 49.8	35.1	168 54.5	42.3	56 56.5	32.9	14 00.6	102	23 51.5	30
12	300 04.7	47 03.1	-18 42.5	295 50.6	+ 1 35.9	183 57.3	+21 42.4	71 58.8	-15 33.0	28 29.8	102	-23 48.5	32
13	315 07.1	62 03.0	42.9	310 51.5	36.6	199 00.1	42.5	87 01.1	33.0	42 59.0	101	23 45.3	33
14	330 09.6	77 02.9	43.3	325 52.3	37.4	214 02.9	42.5	102 03.4	33.0	57 28.1	102	23 42.0	35
15	345 12.1	92 02.8	43.6	340 53.1	38.1	229 05.7	42.6	117 05.8	33.1	71 57.3	102	23 38.5	35
16	0 14.5	107 02.7	44.0	355 54.0	38.9	244 08.5	42.7	132 08.1	33.1	86 26.5	102	23 35.0	37
17	15 17.0	122 02.6	44.4	10 54.8	39.6	259 11.4	42.7	147 10.4	33.1	100 55.7	101	23 31.3	38
18	30 19.5	137 02.5	-18 44.7	25 55.7	+ 1 40.4	274 14.2	+21 42.8	162 12.7	-15 33.2	115 24.8	102	-23 27.5	39
19	45 21.9	152 02.4	45.1	40 56.5	41.1	289 17.0	42.9	177 15.0	33.2	129 54.0	102	23 23.6	40
20	60 24.4	167 02.3	45.5	55 57.3	41.9	304 19.8	42.9	192 17.3	33.2	144 23.2	103	23 19.6	42
21	75 26.9	182 02.1	45.9	70 58.2	42.6	319 22.6	43.0	207 19.6	33.3	158 52.5	102	23 15.4	43
22	90 29.3	197 02.0	46.2	85 59.0	43.4	334 25.4	43.0	222 21.9	33.3	173 21.7	102	23 11.1	44
23	105 31.8	212 01.9	46.6	100 59.8	44.1	349 28.3	43.1	237 24.2	33.3	187 50.9	103	23 06.7	45
24	120 34.3	227 01.8	-18 47.0	116 00.7	+ 1 44.9	4 31.1	+21 43.2	252 26.5	-15 33.4	202 20.2	102	-23 02.2	+ 46
code	-	- 1	- 4	+ 8	+ 8	+ 28	+ 1	+ 23	- 1				

G M T	VENUS -4.1		MARS 1.1		JUPITER -2.2		SATURN 0.8		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
22	h	o	o	o	o	o	o	o	o	o	o	o
	120 34.3	227 01.8 -18 47.0	116 00.7 + 1 44.9	4 31.1 +21 43.2	252 26.5 -15 33.4	202 20.2 102 -23 02.2 + 46						
	1 135 36.7	242 01.7 47.3	131 01.5 45.6	19 33.9 43.2	267 28.8 33.4	216 49.4 103 22 57.6 + 47						
	2 150 39.2	257 01.6 47.7	146 02.4 46.4	34 36.7 43.3	282 31.1 33.4	231 18.7 103 22 52.9 + 49						
	3 165 41.6	272 01.5 .. 48.1	161 03.2 .. 47.1	49 39.5 .. 43.4	297 33.4 .. 33.5	245 48.0 103 22 48.0 + 50						
	4 180 44.1	287 01.3 48.4	176 04.0 47.9	64 42.3 43.4	312 35.7 33.5	260 17.3 103 22 43.0 + 51						
	5 195 46.6	302 01.2 48.8	191 04.9 48.6	79 45.1 43.5	327 38.0 33.5	274 46.6 103 22 37.9 + 52						
	6 210 49.0	317 01.1 -18 49.2	206 05.7 + 1 49.4	94 48.0 +21 43.5	342 40.3 -15 33.6	289 15.9 104 22 32.7 + 53						
	7 225 51.5	332 01.0 49.5	221 06.6 50.1	109 50.8 43.6	357 42.6 33.6	303 45.3 104 22 27.4 + 55						
	8 240 54.0	347 00.8 49.9	236 07.4 50.9	124 53.6 43.7	12 44.9 33.7	318 14.7 103 22 21.9 + 56						
	9 255 56.4	2 00.7 .. 50.3	251 08.2 .. 51.6	139 56.4 .. 43.7	27 47.3 .. 33.7	332 44.0 104 22 16.3 + 57						
	10 270 58.9	17 00.6 50.6	266 09.1 52.4	154 59.2 43.8	42 49.6 33.7	347 13.4 105 22 10.6 + 58						
	11 286 01.4	32 00.5 .. 51.0	281 09.9 53.1	170 02.0 43.9	57 51.9 33.8	1 42.9 104 22 04.8 + 59						
	12 301 03.8	47 00.3 -18 51.4	296 10.7 + 1 53.9	185 04.8 +21 43.9	72 54.2 -15 33.8	16 12.3 105 22 58.9 + 60						
	13 316 06.3	62 00.2 51.7	311 11.6 54.6	200 07.7 44.0	87 56.5 33.8	30 41.8 105 21 52.9 + 61						
	14 331 08.8	77 00.1 52.1	326 12.4 55.4	215 10.5 44.1	102 58.8 33.9	45 11.3 105 21 46.8 + 63						
	15 346 11.2	92 00.0 .. 52.5	341 13.3 .. 56.1	230 13.3 .. 44.1	118 01.1 .. 33.9	59 40.8 105 21 40.5 + 64						
	16 1 13.7	106 59.8 52.8	356 14.1 56.9	245 16.1 44.2	133 03.4 33.9	74 10.3 105 21 34.1 + 65						
	17 16 16.1	121 59.7 53.2	11 14.9 57.6	260 18.9 44.2	148 05.7 34.0	88 39.8 106 21 27.6 + 65						
	18 31 18.6	136 59.6 -18 53.5	26 15.8 + 1 58.4	275 21.7 +21 44.3	163 08.0 -15 34.0	103 09.4 106 22 21.1 + 68						
	19 46 21.1	151 59.4 53.9	41 16.6 59.1	290 24.5 44.4	178 10.3 34.0	117 39.0 106 21 14.3 + 68						
	20 61 23.5	166 59.3 54.3	56 17.5 1 59.8	305 27.3 44.4	193 12.6 34.1	132 08.6 107 21 07.5 + 69						
	21 76 26.0	181 59.2 .. 54.6	71 18.3 .. 2 00.6	320 30.2 .. 44.5	208 15.0 .. 34.1	146 38.3 106 21 00.6 + 70						
	22 91 28.5	196 59.0 55.0	86 19.1 01.3	335 33.0 44.6	223 17.3 34.1	161 07.9 107 20 53.6 + 72						
23 106 30.9	211 58.9 55.3	101 20.0 02.1	350 35.8 44.6	238 19.6 34.2	175 37.6 108 20 46.4 + 72							
23	0 121 33.4	226 58.8 -18 55.7	116 20.8 + 2 02.8	5 38.6 +21 44.7	253 21.9 -15 34.2	190 07.4 107 -20 39.2 + 74						
	1 136 35.9	241 58.6 56.1	131 21.6 03.6	20 41.4 44.7	268 24.2 34.2	204 37.1 108 20 31.8 + 75						
	2 151 38.3	256 58.5 56.4	146 22.5 04.3	35 44.2 44.8	283 26.5 34.2	219 06.9 108 20 24.3 + 76						
	3 166 40.8	271 58.3 .. 56.8	161 23.3 .. 05.1	50 47.0 .. 44.9	298 28.8 .. 34.3	233 36.7 108 20 16.7 + 77						
	4 181 43.2	286 58.2 57.1	176 24.2 05.8	65 49.9 44.9	313 31.1 34.3	248 06.5 109 20 09.0 + 77						
	5 196 45.7	301 58.0 57.5	191 25.0 06.6	80 52.7 45.0	328 33.4 34.3	262 36.4 108 20 01.3 + 79						
	6 211 48.2	316 57.9 -18 57.8	206 25.8 + 2 07.3	95 55.5 +21 45.0	343 35.7 -15 34.4	277 06.2 110 -19 53.4 + 80						
	7 226 50.6	331 57.8 58.2	221 26.7 08.1	110 58.3 45.1	358 38.0 34.4	291 36.2 109 19 45.4 + 82						
	8 241 53.1	346 57.6 58.6	236 27.5 08.8	126 01.1 45.2	13 40.4 34.4	306 06.1 110 19 37.2 + 82						
	9 256 55.6	1 57.5 .. 58.9	251 28.3 .. 09.6	141 03.9 .. 45.2	28 42.7 .. 34.5	320 36.1 110 19 29.0 + 83						
	10 271 58.0	16 57.3 59.3	266 29.2 10.3	156 06.7 45.3	43 45.0 34.5	335 06.1 110 19 20.7 + 84						
	11 287 00.5	31 57.2 18 59.6	281 30.0 11.1	171 09.5 45.4	58 47.3 34.5	349 36.1 111 19 12.3 + 85						
	12 302 03.0	46 57.0 -19 00.0	296 30.9 + 2 11.8	186 12.4 +21 45.4	73 49.6 -15 34.6	4 06.2 111 -19 03.8 + 86						
	13 317 05.4	61 56.9 00.3	311 31.7 12.6	201 15.2 45.5	88 51.9 34.6	18 36.3 111 18 55.2 + 87						
	14 332 07.9	76 56.7 00.7	326 32.5 13.3	216 18.0 45.5	103 54.2 34.6	33 06.4 111 18 46.5 + 89						
	15 347 10.4	91 56.6 .. 01.0	341 33.4 .. 14.1	231 20.8 .. 45.6	118 56.5 .. 34.7	47 36.5 112 18 37.6 + 89						
	16 2 12.8	106 56.4 01.4	356 34.2 14.8	246 23.6 45.7	133 58.8 34.7	62 06.7 112 18 28.7 + 90						
	17 17 15.3	121 56.2 01.7	11 35.1 15.6	261 26.4 45.7	149 01.2 34.7	76 36.9 113 18 19.7 + 91						
	18 32 17.7	136 56.1 -19 02.1	26 35.9 + 2 16.3	276 29.2 +21 45.8	164 03.5 -15 34.8	91 07.2 113 18 10.6 + 92						
	19 47 20.2	151 55.9 02.4	41 36.7 17.1	291 32.0 45.9	179 05.8 34.8	105 37.5 113 18 01.4 + 93						
	20 62 22.7	166 55.8 02.8	56 37.6 17.8	306 34.8 45.9	194 08.1 34.8	120 07.8 113 17 52.1 + 94						
	21 77 25.1	181 55.6 .. 03.2	71 38.4 .. 18.6	321 37.7 .. 46.0	209 10.4 .. 34.9	134 38.1 114 17 42.7 + 95						
	22 92 27.6	196 55.5 03.5	86 39.2 19.3	336 40.5 46.0	224 12.7 34.9	149 08.5 114 17 33.2 + 96						
	23 107 30.1	211 55.3 03.8	101 40.1 20.0	351 43.3 46.1	239 15.0 34.9	163 38.9 114 17 23.6 + 97						
24	0 122 32.5	226 55.1 -19 04.2	116 40.9 + 2 20.8	6 46.1 +21 46.2	254 17.3 -15 35.0	178 09.3 115 -17 13.9 + 97						
	1 137 35.0	241 55.0 04.5	131 41.8 21.5	21 48.9 46.2	269 19.7 35.0	192 39.8 115 17 04.2 + 99						
	2 152 37.5	256 54.8 04.9	146 42.6 22.3	36 51.7 46.3	284 22.0 35.0	207 10.3 115 16 54.3 +100						
	3 167 39.9	271 54.6 .. 05.2	161 43.4 .. 23.0	51 54.5 .. 46.3	299 24.3 .. 35.1	221 40.8 115 16 44.3 +100						
	4 182 42.4	286 54.5 05.6	176 44.3 23.8	66 57.3 46.4	314 26.6 35.1	236 11.3 116 16 34.3 +101						
	5 197 44.9	301 54.3 05.9	191 45.1 24.5	82 00.1 46.5	329 28.9 35.1	250 41.9 116 16 24.2 +102						
	6 212 47.3	316 54.2 -19 06.3	206 45.9 + 2 25.3	97 03.0 +21 46.5	344 31.2 -15 35.2	265 12.5 117 -16 14.0 +103						
	7 227 49.8	331 54.0 06.6	221 46.8 26.0	112 05.8 46.6	359 33.5 35.2	279 43.2 117 16 03.7 +104						
	8 242 52.2	346 53.8 07.0	236 47.6 26.8	127 08.6 46.7	14 35.9 35.2	294 13.9 117 15 53.3 +105						
	9 257 54.7	1 53.6 .. 07.3	251 48.5 .. 27.5	142 11.4 .. 46.7	29 38.2 .. 35.2	308 44.6 117 15 42.8 +106						
	10 272 57.2	16 53.5 07.7	266 49.3 28.3	157 14.2 46.8	44 40.5 35.3	323 15.3 118 15 32.2 +106						
	11 287 59.6	31 53.3 08.0	281 50.1 29.0	172 17.0 46.8	59 42.8 35.3	337 46.1 118 15 21.6 +107						
	12 303 02.1	46 53.1 -19 08.3	296 51.0 + 2 29.8	187 19.8 +21 46.9	74 45.1 -15 35.3	352 16.9 118 -15 10.9 +108						
	13 318 04.6	61 53.0 08.7	311 51.8 30.5	202 22.6 47.0	89 47.4 35.4	6 47.7 119 15 00.1 +109						
	14 333 07.0	76 52.8 09.0	326 52.7 31.3	217 25.4 47.0	104 49.7 35.4	21 18.6 119 14 49.2 +110						
	15 348 09.5	91 52.6 .. 09.4	341 53.5 .. 32.0	232 28.2 .. 47.1	119 52.1 .. 35.4	35 49.5 119 14 38.2 +110						
	16 3 12.0	106 52.4 09.7	356 54.3 32.7	247 31.1 47.1	134 54.4 35.5	50 20.4 120 14 27.2 +111						
	17 18 14.4	121 52.3 10.1	11 55.2 33.5	262 33.9 47.2	149 56.7 35.5	64 51.4 119 14 16.1 +112						
	18 33 16.9	136 52.1 -19 10.4	26 56.0 + 2 34.2	277 36.7 +21 47.3	164 59.0 -15 35.5	79 22.3 120 -14 04.9 +113						
	19 48 19.4	151 51.9 10.7	41 56.8 35.0	292 39.5 47.3	180 01.3 35.6	93 53.3 121 13 53.6 +114						
	20 63 21.8	166 51.7 11.1	56 57.7 35.7	307 42.3 47.4	195 03.6 35.6	108 24.4 120 13 42.2 +114						
	21 78 24.3	181 51.5 .. 11.4	71 58.5 .. 36.5	322 45.1 .. 47.4	210 06.0 .. 35.6	122 55.4 121 13 30.8 +115						
	22 93 26.7	196 51.4 11.8	86 59.4 37.2	337 47.9 47.5	225 08.3 35.7	137 26.5 121 13 19.3 +115						
	23 108 29.2	211 51.2 12.1	102 00.2 38.0	352 50.7 47.6	240 10.6 35.7	151 57.6 122 13 07.8 +117						
24 123 31.7	226 51.0 -19 12.4	117 01.0 + 2 38.7	7 53.5 +21 47.6	255 12.9 -15 35.7	166 28.8 122 -12 56.1 +117							
code	-	- 1 - 3	+ 8 + 8	+ 28 + 1	+ 23 0							

G M T	SUN		STARS				Lat.	Sunrise	Twilt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS			
	GHA	Dec.	No.	Name	SHA	Dec.				22	23	24	25	Alt.	Sun's Low'r Limb Add	Venus Add	Mars Add
	h ° ' "	° ' "			° ' "	° ' "	h m	h m	h m	h m							
22	0	177 09.3	-19 54.0	7	Acamar	315 51.3	-40 29.2	72	10 46	6 21	10 41	9 42	9 42	Alt.			
	1	192 09.1	53.4	5	Achernar	335 59.2	-57 28.1	70	10 46	6 18	10 41	9 49	9 24	0			
	2	207 08.9	52.9	30	Acrux	173 58.1	-62 50.9	68	10 00	6 15	9 44	9 23	9 09	30	0.6	0.2	0.1
	3	222 08.7	52.3	19	Adhara	255 46.5	-28 54.7	66	9 30	6 12	9 19	9 10	8 58	45	0.6	0.2	0.1
	4	237 08.6	51.8	10	Aldebaran	291 39.4	+16 25.3	64	9 07	6 09	8 39	8 45	8 47	60	0.6	0.1	0.1
	5	252 08.4	51.2					62	8 50	6 06	8 11	8 26	8 34	75	0.6	0.1	0.0
	6	267 08.2	-19 50.6	32	Alioth	166 58.7	+56 11.8	60	8 35	6 04	7 50	8 09	8 23	90	0.6	0.0	0.0
	7	282 08.0	50.1	34	Alkaid	153 33.2	+49 31.8	58	8 22	6 01	7 32	7 56	8 13				
	8	297 07.9	49.5	55	Al Na'ir	28 38.9	-47 10.8	56	8 12	5 59	7 18	7 44	8 04				
	9	312 07.7	48.9	15	Alnilam	276 30.5	-1 13.8	54	8 02	5 57	7 05	7 34	7 56				
	10	327 07.5	48.4	25	Alphard	218 38.7	- 8 27.9	52	7 54	5 55	6 54	7 24	7 49				
	11	342 07.4	47.8					50	7 46	5 53	6 44	7 16	7 43				
	12	357 07.2	-19 47.2	41	Alphecca	126 48.2	+26 51.6	45	7 30	5 48	6 22	6 58	7 29				
	13	12 07.0	46.7	1	Alpheratz	358 29.0	+28 50.7	40	7 16	5 42	6 05	6 44	7 18				
	14	27 06.8	46.1	51	Altair	62 51.2	+ 8 44.9	35	7 05	5 37	5 51	6 32	7 08				
	15	42 06.7	45.5	2	Ankaa	353 58.9	-42 33.1	30	6 55	5 32	5 38	6 21	7 00				
	16	57 06.5	45.0	42	Antares	113 20.2	-26 20.0	20	6 38	5 21	5 17	6 02	6 45				
	17	72 06.3	44.4					10	6 23	5 08	4 58	5 46	6 32				
	18	87 06.2	-19 43.8	37	Arcturus	146 35.6	+19 24.7	0	6 08	4 55	4 41	5 31	6 20				
	19	102 06.0	43.3	43	Atria	109 01.7	-68 56.7	10	5 54	4 38	4 23	5 16	6 08				
	20	117 05.8	42.7	22	Avior	234 35.4	-59 21.9	20	5 38	4 16	4 04	5 00	5 55				
	21	132 05.6	42.1	13	Bellatrix	279 18.7	+ 6 18.6	30	5 20	3 48	3 43	4 41	5 40				
	22	147 05.5	41.6	16	Betelge'se	271 48.4	+ 7 24.0	35	5 09	3 28	3 30	4 30	5 32				
	23	162 05.3	41.0					40	4 57	3 04	3 15	4 17	5 22				
				17	Canopus	264 15.1	-52 40.4	45	4 43	2 30	2 58	4 02	5 10				
				12	Capella	281 38.8	+45 57.4	50	4 25	1 33	2 36	3 44	4 56				
				53	Deneb	50 01.8	+45 07.2	52	4 17	0 43	2 26	3 35	4 49				
				28	Denebola	183 18.0	+14 49.1	54	4 07	///	2 14	3 25	4 42				
				4	Diphda	349 39.8	-18 14.0	56	3 57	///	2 01	3 15	4 33				
								58	3 44	///	1 45	3 02	4 24				
				27	Dubhe	194 44.6	+61 59.3	60	3 30	///	1 27	2 47	4 13				
				14	Elnath	279 07.6	+28 34.3	S									
				47	Eltanin	91 06.9	+51 29.4										
				54	Enif	34 30.4	+ 9 40.1										
				56	Fomalhaut	16 12.4	-29 51.7										
								N	h m	h m	h m	h m	h m				
				31	Gacrux	172 49.6	-56 51.6	72	13 39	18 05	13 00	15 34	17 23				
				29	Gienah	176 37.2	-17 17.7	70	14 25	18 09	13 56	15 58	17 39				
				35	Hadar	149 50.1	-60 09.3	68	14 55	18 12	12 35	14 29	16 17				
				6	Hamal	328 50.2	+23 15.2	66	15 17	18 15	13 15	14 53	16 32				
				48	Kaus Aust.	84 42.2	-34 24.4	64	15 35	18 17	13 42	15 12	16 44				
								62	15 49	18 20	14 03	15 27	16 55				
				40	Kochab	137 18.0	+74 19.9	60	16 02	18 21	14 20	15 40	17 04				
				57	Markab	14 22.2	+14 57.9	58	16 13	18 24	14 35	15 51	17 12				
				8	Menkar	315 00.7	+ 3 54.9	56	16 22	18 26	14 47	16 01	17 19				
				36	Menkent	148 59.2	-36 09.0	54	16 31	18 28	14 58	16 10	17 25				
				24	Miapl'dus	221 48.3	-69 31.9	52	16 38	18 31	15 08	16 18	17 31				
								50	16 54	18 32	15 28	16 34	17 43				
				9	Mirfak	309 42.9	+49 42.5	45	17 08	18 37	15 45	16 48	17 53				
				50	Nunki	76 52.8	-26 21.3	40	17 19	18 42	15 58	16 59	18 02				
				52	Peacock	54 28.6	-56 52.9	35	17 29	18 47	16 10	17 09	18 09				
				21	Pollux	244 20.8	-28 08.1	30	17 46	19 03	16 31	17 26	18 22				
				20	Procyon	245 45.1	+ 5 20.4	20	18 01	19 14	16 49	17 41	18 33				
								10	18 15	19 28	17 05	17 55	18 43				
				46	R'alhague	96 47.3	+12 35.3	0	18 30	19 45	17 21	18 09	18 54				
				26	Regulus	208 29.7	+12 11.0	10	18 45	19 45	17 39	18 23	19 05				
				11	Rigel	281 53.8	- 8 15.2	20	19 03	20 06	17 59	18 40	19 17				
				38	Rigel Kent.	140 51.7	-60 39.0	30	19 13	20 34	18 11	18 49	19 24				
				44	Sabik	103 03.0	-15 40.3	35	19 25	20 53	18 24	19 00	19 32				
								40	19 40	21 17	18 40	19 13	19 42				
				3	Schedar	350 30.8	+56 17.8	45	19 57	21 51	18 59	19 28	19 53				
				45	Shaula	97 21.6	-37 04.3	50	20 06	22 45	19 08	19 36	19 58				
				18	Sirius	259 11.9	-16 39.3	52	20 15	///	19 18	19 44	20 04				
				33	Spica	159 17.3	-10 55.8	54	20 26	///	19 30	19 53	20 10				
				23	Suhail	223 24.3	-43 15.1	56	20 38	///	19 43	20 03	20 17				
								58	20 52	///	19 58	20 14	20 25				
				49	Vega	81 09.0	+38 44.3	60									
				39	Zub'g'bi	137 54.0	-15 51.4	S									

G M T	T GHA	VENUS -4.1		MARS 1.1		JUPITER -2.2		SATURN 0.8		MOON			
		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
25	h	°	'	°	'	°	'	°	'	°	'	°	'
0	123 31.7	226 51.0	-19 12.4	117 01.0	+ 2 38.7	7 53.5	+21 47.6	255 12.9	-15 35.7	166 28.8	122	-12 56.1	+117
1	138 34.1	241 50.8	12.8	132 01.9	39.5	22 56.3	47.7	270 15.2	35.7	181 00.0	122	12 44.4	+118
2	153 36.6	256 50.6	13.1	147 02.7	40.2	37 59.1	47.8	285 17.5	35.8	195 31.2	122	12 32.6	+118
3	168 39.1	271 50.4	13.4	162 03.5	40.9	53 02.0	47.8	300 19.9	35.8	210 02.4	122	-12 20.8	+119
4	183 41.5	286 50.3	13.8	177 04.4	41.7	68 04.8	47.9	315 22.2	35.8	224 33.6	123	12 08.9	+120
5	198 44.0	301 50.1	14.1	192 05.2	42.4	83 07.6	47.9	330 24.5	35.9	239 04.9	123	11 56.9	+121
6	213 46.5	316 49.9	-19 14.4	207 06.1	+ 2 43.2	98 10.4	+21 48.0	345 26.8	-15 35.9	253 36.2	123	-11 44.8	+121
7	228 48.9	331 49.7	14.8	222 06.9	43.9	113 13.2	48.1	0 29.1	35.9	268 07.5	124	11 32.7	+122
8	243 51.4	346 49.5	15.1	237 07.7	44.7	128 16.0	48.1	15 31.4	36.0	282 38.9	123	11 20.5	+122
9	258 53.8	1 49.3	15.4	252 08.6	45.4	143 18.8	48.2	30 33.8	36.0	297 10.2	124	-11 08.3	+123
10	273 56.3	16 49.1	15.8	267 09.4	46.2	158 21.6	48.2	45 36.1	36.0	311 41.6	124	10 56.0	+124
11	288 58.8	31 48.9	16.1	282 10.2	46.9	173 24.4	48.3	60 38.4	36.1	326 13.0	124	10 43.6	+124
12	304 01.2	46 48.7	-19 16.4	297 11.1	+ 2 47.7	188 27.2	+21 48.3	75 40.7	-15 36.1	340 44.4	125	-10 31.2	+125
13	319 03.7	61 48.5	16.8	312 11.9	48.4	203 30.0	48.4	90 43.0	36.1	355 15.9	125	10 18.7	+125
14	334 06.2	76 48.3	17.1	327 12.8	49.1	218 32.8	48.5	105 45.3	36.1	9 47.4	124	10 06.2	+126
15	349 08.6	91 48.1	17.4	342 13.6	49.9	233 35.6	48.5	120 47.7	36.2	24 18.8	126	9 53.6	+126
16	4 11.1	106 47.9	17.8	357 14.4	50.6	248 38.5	48.6	135 50.0	36.2	38 50.4	125	9 41.0	+127
17	19 13.6	121 47.7	18.1	12 15.3	51.4	263 41.3	48.7	150 52.3	36.2	53 21.9	125	9 28.3	+128
18	34 16.0	136 47.5	-19 18.4	27 16.1	+ 2 52.1	278 44.1	+21 48.7	165 54.6	-15 36.3	67 53.4	126	-9 15.5	+128
19	49 18.5	151 47.3	18.8	42 16.9	52.9	293 46.9	48.8	180 56.9	36.3	82 25.0	126	9 02.7	+129
20	64 21.0	166 47.1	19.1	57 17.8	53.6	308 49.7	48.8	195 59.3	36.3	96 56.6	126	8 49.8	+129
21	79 23.4	181 46.9	19.4	72 18.6	54.4	323 52.5	48.9	211 01.6	36.4	111 28.2	126	8 36.9	+129
22	94 25.9	196 46.7	19.7	87 19.5	55.1	338 55.3	49.0	226 03.9	36.4	125 59.8	126	8 24.0	+130
23	109 28.3	211 46.5	20.1	102 20.3	55.8	353 58.1	49.0	241 06.2	36.4	140 31.4	126	8 11.0	+131
26	0 124 30.8	226 46.3	-19 20.4	117 21.1	+ 2 56.6	9 00.9	+21 49.1	256 08.5	-15 36.4	155 03.0	127	-7 57.9	+131
1	139 33.3	241 46.1	20.7	132 22.0	57.3	24 03.7	49.1	271 10.9	36.5	169 34.7	126	7 44.8	+131
2	154 35.7	256 45.9	21.0	147 22.8	58.1	39 06.5	49.2	286 13.2	36.5	184 06.3	127	7 31.7	+132
3	169 38.2	271 45.7	21.4	162 23.6	58.8	54 09.3	49.3	301 15.5	36.5	198 38.0	127	7 18.5	+133
4	184 40.7	286 45.5	21.7	177 24.5	59.6	69 12.1	49.3	316 17.8	36.6	213 09.7	127	7 05.2	+132
5	199 43.1	301 45.3	22.0	192 25.3	60.3	84 14.9	49.4	331 20.1	36.6	227 41.4	127	6 52.0	+134
6	214 45.6	316 45.1	-19 22.3	207 26.2	+ 3 01.1	99 17.7	+21 49.4	346 22.5	-15 36.6	242 13.1	127	-6 38.6	+133
7	229 48.1	331 44.9	22.6	222 27.0	01.8	114 20.6	49.5	1 24.8	36.6	256 44.8	127	6 25.3	+134
8	244 50.5	346 44.7	23.0	237 27.8	02.5	129 23.4	49.6	16 27.1	36.7	271 16.5	127	6 11.9	+134
9	259 53.0	1 44.4	23.3	252 28.7	03.3	144 26.2	49.6	31 29.4	36.7	285 48.2	128	5 58.5	+135
10	274 55.5	16 44.2	23.6	267 29.5	04.0	159 29.0	49.7	46 31.8	36.7	300 20.0	127	5 45.0	+135
11	289 57.9	31 44.0	23.9	282 30.3	04.8	174 31.8	49.7	61 34.1	36.8	314 51.7	127	5 31.5	+135
12	305 00.4	46 43.8	-19 24.3	297 31.2	+ 3 05.5	189 34.6	+21 49.8	76 36.4	-15 36.8	329 23.4	128	-5 18.0	+136
13	320 02.8	61 43.6	24.6	312 32.0	06.3	204 37.4	49.9	91 38.7	36.8	343 55.2	127	5 04.4	+136
14	335 05.3	76 43.4	24.9	327 32.8	07.0	219 40.2	49.9	106 41.0	36.9	358 26.9	128	4 50.8	+136
15	350 07.8	91 43.1	25.2	342 33.7	07.7	234 43.0	50.0	121 43.4	36.9	12 58.7	127	4 37.2	+137
16	5 10.2	106 42.9	25.5	357 34.5	08.5	249 45.8	50.0	136 45.7	36.9	27 30.4	128	4 23.5	+137
17	20 12.7	121 42.7	25.8	12 35.4	09.2	264 48.6	50.1	151 48.0	36.9	42 02.2	127	4 09.8	+137
18	35 15.2	136 42.5	-19 26.2	27 36.2	+ 3 10.0	279 51.4	+21 50.2	166 50.3	-15 37.0	56 33.9	128	-3 56.1	+138
19	50 17.6	151 42.3	26.5	42 37.0	10.7	294 54.2	50.2	181 52.7	37.0	71 05.7	127	3 42.3	+137
20	65 20.1	166 42.0	26.8	57 37.9	11.5	309 57.0	50.3	196 55.0	37.0	85 37.4	128	3 28.6	+138
21	80 22.6	181 41.8	27.1	72 38.7	12.2	324 59.8	50.3	211 57.3	37.1	100 09.2	127	3 14.8	+139
22	95 25.0	196 41.6	27.4	87 39.5	12.9	340 02.6	50.4	226 59.6	37.1	114 40.9	128	3 00.9	+138
23	110 27.5	211 41.4	27.7	102 40.4	13.7	355 05.4	50.4	242 01.9	37.1	129 12.7	127	2 47.1	+139
27	0 125 29.9	226 41.2	-19 28.0	117 41.2	+ 3 14.4	10 08.2	+21 50.5	257 04.3	-15 37.1	143 44.4	127	-2 33.2	+138
1	140 32.4	241 40.9	28.4	132 42.1	15.2	25 11.0	50.6	272 06.6	37.2	158 16.1	127	2 19.4	+139
2	155 34.9	256 40.7	28.7	147 42.9	15.9	40 13.8	50.6	287 08.9	37.2	172 47.8	128	2 05.5	+140
3	170 37.3	271 40.5	29.0	162 43.7	16.7	55 16.6	50.7	302 11.2	37.2	187 19.6	127	1 51.5	+139
4	185 39.8	286 40.2	29.3	177 44.6	17.4	70 19.4	50.7	317 13.6	37.3	201 51.3	127	1 37.6	+140
5	200 42.3	301 40.0	29.6	192 45.4	18.1	85 22.2	50.8	332 15.9	37.3	216 23.0	126	1 23.6	+139
6	215 44.7	316 39.8	-19 29.9	207 46.2	+ 3 18.9	100 25.0	+21 50.9	347 18.2	-15 37.3	230 54.8	127	-1 09.7	+140
7	230 47.2	331 39.5	30.2	222 47.1	19.6	115 27.8	50.9	2 20.5	37.3	245 26.3	127	0 55.7	+140
8	245 49.7	346 39.3	30.5	237 47.9	20.4	130 30.7	51.0	17 22.9	37.4	259 58.0	126	0 41.7	+140
9	260 52.1	1 39.1	30.8	252 48.7	21.1	145 33.5	51.0	32 25.2	37.4	274 29.6	126	0 27.7	+140
10	275 54.6	16 38.9	31.1	267 49.6	21.9	160 36.3	51.1	47 27.5	37.4	289 01.2	126	-0 13.7	+140
11	290 57.1	31 38.6	31.4	282 50.4	22.6	175 39.1	51.2	62 29.8	37.5	303 32.8	126	+ 0 00.3	+140
12	305 59.5	46 38.4	-19 31.8	297 51.3	+ 3 23.3	190 41.9	+21 51.2	77 32.2	-15 37.5	318 04.4	126	+ 0 14.3	+141
13	321 02.0	61 38.1	32.1	312 52.1	24.1	205 44.7	51.3	92 34.5	37.5	332 36.0	126	+ 0 28.4	+140
14	336 04.4	76 37.9	32.4	327 52.9	24.8	220 47.5	51.3	107 36.8	37.5	347 07.6	125	+ 0 42.4	+141
15	351 06.9	91 37.7	32.7	342 53.8	25.6	235 50.3	51.4	122 39.2	37.6	1 39.1	126	+ 0 56.5	+140
16	6 09.4	106 37.4	33.0	357 54.6	26.3	250 53.1	51.5	137 41.5	37.6	16 10.7	125	+ 1 10.5	+140
17	21 11.8	121 37.2	33.3	12 55.4	27.0	265 55.9	51.5	152 43.8	37.6	30 42.2	124	+ 1 24.5	+141
18	36 14.3	136 36.9	-19 33.6	27 56.3	+ 3 27.8	280 58.7	+21 51.6	167 46.1	-15 37.6	45 13.6	125	+ 1 38.6	+140
19	51 16.8	151 36.7	33.9	42 57.1	28.5	296 01.5	51.6	182 48.5	37.7	59 45.1	124	+ 1 52.6	+141
20	66 19.2	166 36.5	34.2	57 57.9	29.3	311 04.3	51.7	197 50.8	37.7	74 16.5	124	+ 2 06.7	+140
21	81 21.7	181 36.2	34.5	72 58.8	30.0	326 07.1	51.7	212 53.1	37.7	88 47.9	124	+ 2 20.7	+140
22	96 24.2	196 36.0	34.8	87 59.6	30.7	341 09.9	51.8	227 55.4	37.8	103 19.3	124	+ 2 34.7	+141
23	111 26.6	211 35.7	35.1	103 00.5	31.5	356 12.7	51.9	242 57.8	37.8	117 50.7	123	+ 2 48.8	+140
24	126 29.1	226 35.5	-19 35.4	118 01.3	+ 3 32.2	11 15.5	+21 51.9	258 00.1	-15 37.8	132 22.0	123	+ 3 02.8	+140
code	-	- 2	- 3	+ 8	+ 8	+ 28	+ 1	+ 23	0				

G M T	SUN		STARS				Lat.	Sunrise	Twilt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.	No.	Name	SHA	Dec.				25	26	27	28	Alt.	Sun's Low'r Limb				
															Add	Add	Add		
25	0	176 57.4	-19 12.2	7	Acamar	315 51.4	-40 29.2	72	12 02	6 14	9 42	9 13	8 50	8 26	Alt.	Sun's Low'r Limb	Venus	Mars	
	1	191 57.3	11.6	5	Achernar	335 59.2	-57 28.1	70	10 25	6 11	9 24	9 05	8 49	8 33		Add	Add	Add	
	2	206 57.1	11.0	30	Acrux	173 58.1	-62 50.9	68	9 46	6 09	9 09	8 58	8 48	8 38					
	3	221 57.0	10.4	19	Adhara	255 46.5	-28 54.7	66	9 20	6 06	8 58	8 53	8 47	8 43					
	4	236 56.8	09.8	10	Aldebaran	291 39.4	+16 25.3	64	8 59	6 04	8 48	8 48	8 47	8 47	0	0.6	0.2	0.1	
	5	251 56.7	09.2					62	8 43	6 02	8 39	8 43	8 47	8 50	30	0.6	0.2	0.1	
	6	266 56.5	-19 08.6	32	Alioth	166 58.7	+56 11.8	60	8 29	6 00	8 32	8 40	8 46	8 53	45	0.6	0.1	0.1	
	7	281 56.4	08.0	34	Alkaid	153 33.1	+49 31.8	58	8 17	5 58	8 26	8 36	8 46	8 56	60	0.6	0.1	0.1	
	8	296 56.2	07.3	55	Al Na'ir	28 38.9	-47 10.8	56	8 07	5 56	8 20	8 33	8 46	8 58	75	0.6	0.1	0.0	
	9	311 56.1	06.7	15	Alnilam	276 30.5	-1 13.8	54	7 58	5 54	8 15	8 31	8 45	9 00	90	0.6	0.0	0.0	
	10	326 55.9	06.1	25	Alphard	218 38.7	-8 27.9	52	7 50	5 52	8 10	8 28	8 45	9 02					
	11	341 55.8	05.5					50	7 43	5 50	8 06	8 26	8 45	9 04	Moon's Lower Limb				
	12	356 55.7	-19 04.9	41	Alphecca	126 48.1	+26 51.6	45	7 27	5 46	7 56	8 21	8 44	9 08	Add				
	13	11 55.5	04.3	1	Alpheratz	358 29.0	+28 50.7	40	7 14	5 41	7 49	8 17	8 44	9 11	Alt.	25	26	27	
	14	26 55.4	03.7	51	Altair	62 51.2	+8 44.9	35	7 03	5 36	7 42	8 13	8 44	9 14	0				
	15	41 55.2	03.1	2	Ankaa	353 58.9	-42 33.1	30	6 54	5 31	7 36	8 10	8 43	9 17	4	15.6	16.1	16.7	
	16	56 55.1	02.5	42	Antares	113 20.1	-26 20.0	20	6 37	5 21	7 26	8 05	8 43	9 22	8	15.6	16.1	16.7	
	17	71 54.9	01.9					10	6 23	5 10	7 17	8 00	8 42	9 26	12	15.6	16.0	16.7	
	18	86 54.8	-19 01.2	37	Arcturus	146 35.6	+19 24.6	0	6 09	4 56	7 08	7 55	8 42	9 29	16	15.6	16.0	16.7	
	19	101 54.6	00.6	43	Atria	109 01.7	-68 56.7	10	5 55	4 40	7 00	7 51	8 42	9 33	20	15.6	16.0	16.7	
	20	116 54.5	19 00.0	22	Avior	234 35.4	-59 22.0	20	5 40	4 19	6 51	7 46	8 41	9 37	24	15.6	16.0	16.7	
	21	131 54.3	18 59.4	13	Bellatrix	279 18.7	+6 18.6	30	5 23	3 51	6 40	7 40	8 41	9 42	28	15.6	16.0	16.6	
	22	146 54.2	58.8	16	Betelge'se	271 48.4	+7 24.0	35	5 13	3 32	6 34	7 37	8 41	9 45	32	15.6	16.0	16.6	
	23	161 54.0	58.2					40	5 01	3 09	6 27	7 34	8 40	9 48	36	15.6	16.0	16.6	
26	0	176 53.9	-18 57.5	12	Capella	281 38.8	+45 57.4	50	4 30	1 44	6 10	7 24	8 40	9 56	40	15.6	16.0	16.5	
	1	191 53.8	56.9	53	Deneb	50 01.8	+45 07.2	52	4 22	1 06	6 05	7 22	8 40	9 58	44	15.6	16.0	16.5	
	2	206 53.6	56.3	28	Denebola	183 18.0	+14 49.1	54	4 13	///	6 00	7 19	8 39	10 01	48	15.6	15.9	16.4	
	3	221 53.5	55.7	4	Diphda	349 39.8	-18 14.0	56	4 03	///	5 55	7 17	8 39	10 03	52	15.6	15.9	16.4	
	4	236 53.3	55.1					58	3 52	///	5 48	7 13	8 39	10 06	56	15.6	15.9	16.3	
	5	251 53.2	54.4	27	Dubhe	194 44.6	+61 59.3	60	3 38	///	5 41	7 10	8 39	10 09	60	15.6	15.9	16.3	
	6	266 53.0	-18 53.8	14	Elnath	279 07.6	+28 34.3	S							64	15.6	15.8	16.2	
	7	281 52.9	53.2	47	Eltanin	91 06.9	+51 29.4		Lat.	Sunset	Twilt. ends	Moonset				68	15.6	15.8	16.2
	8	296 52.8	52.6	54	Enif	34 30.4	+9 9.0		N			25	26	27	28	72	15.6	15.8	16.1
	9	311 52.6	52.0	56	Fomalhaut	16 12.4	-29 51.7		h m	h m	h m	h m	h m	h m		76	15.6	15.7	16.0
	10	326 52.5	51.3					72	12 23	18 14	17 23	19 30	21 35	23 44	80	15.6	15.7	16.0	
	11	341 52.3	50.7	31	Gacrux	172 49.5	-56 51.6	70	14 01	18 18	17 39	19 36	21 31	23 31	84	15.6	15.7	15.9	
	12	356 52.2	-18 50.1	29	Gienah	176 37.2	-17 17.7	68	14 40	18 20	17 51	19 40	21 29	23 20	88	15.6	15.7	15.9	
	13	11 52.1	49.5	35	Hadar	149 50.1	-60 09.3	66	15 06	18 21	18 01	19 44	21 26	23 11	90	15.6	15.7	15.8	
	14	26 51.9	48.8	6	Hamal	328 50.2	+23 15.2	64	15 27	18 24	18 10	19 47	21 24	23 04	Add to table, back cover				
	15	41 51.8	48.2	48	Kaus Aust.	84 42.1	-34 24.4	62	15 43	18 25	18 17	19 50	21 23	22 58	Moon's Upper Limb				
	16	56 51.6	47.6					60	15 57	18 28	18 23	19 52	21 21	22 52	Subtract				
	17	71 51.5	47.0	40	Kochab	137 18.0	+74 19.9	58	16 09	18 30	18 29	19 54	21 20	22 48	Alt.	25	26	27	
	18	86 51.4	-18 46.3	57	Markab	14 22.2	+14 57.9	56	16 19	18 31	18 33	19 56	21 19	22 43	0	15.6	15.3	14.9	
	19	101 51.2	45.7	8	Menkar	315 00.7	+3 54.9	54	16 28	18 33	18 38	19 57	21 18	22 40	4	15.6	15.3	14.9	
	20	116 51.1	45.1	36	Menkent	148 59.2	-36 09.0	52	16 36	18 35	18 42	19 59	21 17	22 36	8	15.6	15.3	14.9	
	21	131 51.0	44.4	24	Miapl'dus	221 48.3	-69 31.9	50	16 43	18 36	18 45	20 00	21 16	22 33	12	15.6	15.3	14.9	
	22	146 50.8	43.8					45	16 58	18 40	18 53	20 03	21 14	22 26	16	15.6	15.3	14.9	
	23	161 50.7	43.2	9	Mirfak	309 42.9	+49 42.5	40	17 11	18 45	18 59	20 05	21 13	22 21	20	15.6	15.3	14.9	
27	0	176 50.6	-18 42.6	50	Nunki	76 52.8	-26 21.3	35	17 22	18 50	19 04	20 07	21 11	22 16	24	15.6	15.3	15.0	
	1	191 50.4	41.9	52	Peacock	54 28.6	-56 52.8	30	17 32	18 55	19 09	20 09	21 10	22 12	28	15.6	15.3	15.0	
	2	206 50.3	41.3	21	Pollux	244 20.8	+28 08.1	20	17 48	19 04	19 17	20 12	21 08	22 05	32	15.6	15.3	15.1	
	3	221 50.2	40.7	20	Procyon	245 45.1	+5 20.4	10	18 02	19 15	19 24	20 15	21 06	21 58	36	15.6	15.4	15.1	
	4	236 50.0	40.0	46	R'alhague	96 47.3	+12 35.3	0	18 16	19 29	19 31	20 18	21 04	21 52	40	15.6	15.4	15.2	
	5	251 49.9	39.4	26	Regulus	208 29.7	+12 11.0	10	18 30	19 45	19 37	20 20	21 03	21 46	44	15.6	15.4	15.2	
	6	266 49.8	-18 38.8	11	Rigel	281 53.8	-8 15.2	20	18 45	20 05	19 44	20 23	21 01	21 40	48	15.6	15.4	15.2	
	7	281 49.6	38.1	38	Rigel Kent.	140 51.7	-60 39.0	30	19 02	20 32	19 52	20 26	20 59	21 33	52	15.6	15.4	15.2	
	8	296 49.5	37.5	44	Sabik	103 02.9	-15 40.3	35	19 12	20 50	19 56	20 27	20 57	21 29	56	15.6	15.4	15.2	
	9	311 49.4	36.8					40	19 23	21 13	20 02	20 29	20 56	21 24	60	15.6	15.4	15.3	
	10	326 49.2	36.2	3	Schedar	350 30.8	+56 17.8	45	19 37	21 45	20 07	20 31	20 55	21 19	64	15.6	15.4	15.3	
	11	341 49.1	35.6	45	Shaula	97 21.6	-37 04.3	50	19 54	22 35	20 14	20 34	20 53	21 13	68	15.6	15.4	15.3	
	12	356 49.0	-18 34.9	18	Sirius	259 11.9	-16 39.3	52	20 02	23 10	20 17	20 35	20 52	21 10	72	15.6	15.4	15.4	
	13	11 48.8	34.3	33	Spica	159 17.3	-10 55.8	54	20 10	///	20 21	20 36	20 51	21 06	76	15.6	15.4	15.4	
	14	26 48.7	33.7	23	Suhail	223 24.2	-43 15.1	56	20 20	///	20 25	20 37	20 50	21 03	80	15.6	15.4	15.5	
	15	41 48.6	33.0					58	20 32	///	20 29	20 39	20 49	20 59	84	15.6	15.4	15.5	
	16	56 48.4	32.4	49															

G M T	VENUS -4.0		MARS 1.2		JUPITER -2.2		SATURN 0.8		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
h	°	°	°	°	°	°	°	°	°	°	°	°
28 0	126 29.1	226 35.5	-19 35.4	118 01.3	+ 3 32.2	11 15.5	+21 51.9	258 00.1	-15 37.8	132 22.0	123 + 3	02.8 +140
1	141 31.5	241 35.2	35.7	133 02.1	33.0	26 18.3	52.0	273 02.4	37.8	146 53.3	122	3 16.8 +140
2	156 34.0	256 35.0	36.0	148 03.0	33.7	41 21.1	52.0	288 04.8	37.9	161 24.5	123	3 30.8 +140
3	171 36.5	271 34.7	.. 36.3	163 03.8	.. 34.5	56 23.9	.. 52.1	303 07.1	.. 37.9	175 55.8	122	3 44.8 +140
4	186 38.9	286 34.5	36.6	178 04.6	35.2	71 26.7	52.2	318 09.4	37.9	190 27.0	122	3 58.8 +139
5	201 41.4	301 34.2	36.9	193 05.5	35.9	86 29.5	52.2	333 11.7	38.0	204 58.2	121	4 12.7 +140
6	216 43.9	316 34.0	-19 37.2	208 06.3	+ 3 36.7	101 32.3	+21 52.3	348 14.1	-15 38.0	219 29.3	121	4 26.7 +139
7	231 46.3	331 33.7	37.5	223 07.1	37.4	116 35.1	52.3	3 16.4	38.0	234 00.4	121	4 40.6 +139
8	246 48.8	346 33.5	37.8	238 08.0	38.2	131 37.9	52.4	18 18.7	38.0	248 31.5	120	4 54.5 +140
9	261 51.3	1 33.2	.. 38.1	253 08.8	.. 38.9	146 40.7	.. 52.4	33 21.1	.. 38.1	263 02.5	120	5 08.5 +138
10	276 53.7	16 33.0	38.4	268 09.7	39.6	161 43.5	52.5	48 23.4	38.1	277 33.5	119	5 22.3 +139
11	291 56.2	31 32.7	38.6	283 10.5	40.4	176 46.3	52.6	63 25.7	38.1	292 04.4	119	5 36.2 +138
12	306 58.7	46 32.5	-19 38.9	298 11.3	+ 3 41.1	191 49.1	+21 52.6	78 28.0	-15 38.1	306 35.3	119	5 50.0 +139
13	322 01.1	61 32.2	39.2	313 12.2	41.9	206 51.9	52.7	93 30.4	38.2	321 06.2	118	6 03.9 +137
14	337 03.6	76 32.0	39.5	328 13.0	42.6	221 54.7	52.7	108 32.7	38.2	335 37.0	118	6 17.6 +138
15	352 06.0	91 31.7	.. 39.8	343 13.8	.. 43.3	236 57.5	.. 52.8	123 35.0	.. 38.2	350 07.8	118	6 31.4 +138
16	7 08.5	106 31.4	40.1	358 14.7	44.1	252 00.3	52.8	138 37.4	38.2	4 38.6	117	6 45.2 +137
17	22 11.0	121 31.2	40.4	13 15.5	44.8	267 03.1	52.9	153 39.7	38.3	19 09.3	116	6 58.9 +137
18	37 13.4	136 30.9	-19 40.7	28 16.3	+ 3 45.6	282 05.9	+21 53.0	168 42.0	-15 38.3	33 39.9	116	7 12.6 +136
19	52 15.9	151 30.7	41.0	43 17.2	46.3	297 08.7	53.0	183 44.4	38.3	48 10.5	116	7 26.2 +136
20	67 18.4	166 30.4	41.3	58 18.0	47.0	312 11.5	53.1	198 46.7	38.4	62 41.1	115	7 39.8 +136
21	82 20.8	181 30.1	.. 41.5	73 18.9	.. 47.8	327 14.3	.. 53.1	213 49.0	.. 38.4	77 11.6	115	7 53.4 +136
22	97 23.3	196 29.9	41.8	88 19.7	48.5	342 17.1	53.2	228 51.3	38.4	91 42.1	114	8 07.0 +135
23	112 25.8	211 29.6	42.1	103 20.5	49.2	357 19.8	53.2	243 53.7	38.4	106 12.5	113	8 20.5 +135
29 0	127 28.2	226 29.4	-19 42.4	118 21.4	+ 3 50.0	12 22.6	+21 53.3	258 56.0	-15 38.5	120 42.8	113	+ 8 34.0 +134
1	142 30.7	241 29.1	42.7	133 22.2	50.7	27 25.4	53.4	273 58.3	38.5	135 13.1	113	8 47.4 +134
2	157 33.2	256 28.8	43.0	148 23.0	51.5	42 28.2	53.4	289 00.7	38.5	149 43.4	112	9 00.8 +134
3	172 35.6	271 28.6	.. 43.3	163 23.9	.. 52.2	57 31.0	.. 53.5	304 03.0	.. 38.5	164 13.6	111	9 14.2 +133
4	187 38.1	286 28.3	43.5	178 24.7	52.9	72 33.8	53.5	319 05.3	38.6	178 43.7	111	9 27.5 +133
5	202 40.5	301 28.0	43.8	193 25.5	53.7	87 36.6	53.6	334 07.7	38.6	193 13.8	111	9 40.8 +132
6	217 43.0	316 27.7	-19 44.1	208 26.4	+ 3 54.4	102 39.4	+21 53.7	349 10.0	-15 38.6	207 43.9	110	+ 9 54.0 +132
7	232 45.5	331 27.5	44.4	223 27.2	55.2	117 42.2	53.7	4 12.3	38.6	222 13.9	109	10 07.2 +131
8	247 47.9	346 27.2	44.7	238 28.0	55.9	132 45.0	53.8	19 14.7	38.7	236 43.8	108	10 20.3 +131
9	262 50.4	1 26.9	.. 45.0	253 28.9	.. 56.6	147 47.8	.. 53.8	34 17.0	.. 38.7	251 13.6	108	10 33.4 +130
10	277 52.9	16 26.7	45.2	268 29.7	57.4	162 50.6	53.9	49 19.3	38.7	265 43.4	108	10 46.4 +130
11	292 55.3	31 26.4	45.5	283 30.6	58.1	177 53.4	53.9	64 21.7	38.7	280 13.2	106	10 59.4 +130
12	307 57.8	46 26.1	-19 45.8	298 31.4	+ 3 58.8	192 56.2	+21 54.0	79 24.0	-15 38.8	294 42.8	107	+11 12.4 +128
13	323 00.3	61 25.8	46.1	313 32.2	3 59.6	207 59.0	54.0	94 26.3	38.8	309 12.5	105	11 25.2 +129
14	338 02.7	76 25.6	46.3	328 33.1	4 00.3	223 01.8	54.1	109 28.7	38.8	323 42.0	105	11 38.1 +127
15	353 05.2	91 25.3	.. 46.6	343 33.9	.. 01.1	238 04.6	.. 54.2	124 31.0	.. 38.9	338 11.5	104	11 50.8 +127
16	8 07.6	106 25.0	46.9	358 34.7	01.8	253 07.4	54.2	139 33.3	38.9	352 40.9	104	12 03.5 +127
17	23 10.1	121 24.7	47.2	13 35.6	02.5	268 10.2	54.3	154 35.7	38.9	7 10.3	103	12 16.2 +126
18	38 12.6	136 24.4	-19 47.4	28 36.4	+ 4 03.3	283 13.0	+21 54.3	169 38.0	-15 38.9	21 39.6	102	+12 28.8 +125
19	53 15.0	151 24.2	47.7	43 37.2	04.0	298 15.8	54.4	184 40.3	39.0	36 08.8	101	12 41.3 +124
20	68 17.5	166 23.9	48.0	58 38.1	04.7	313 18.6	54.4	199 42.7	39.0	50 37.9	101	12 53.7 +124
21	83 20.0	181 23.6	.. 48.3	73 38.9	.. 05.5	328 21.4	.. 54.5	214 45.0	.. 39.0	65 07.0	100	13 06.1 +124
22	98 22.4	196 23.3	48.5	88 39.7	06.2	343 24.1	54.6	229 47.3	39.0	79 36.0	100	13 18.5 +122
23	113 24.9	211 23.0	48.8	103 40.6	07.0	358 26.9	54.6	244 49.7	39.1	94 05.0	99	13 30.7 +122
30 0	128 27.4	226 22.8	-19 49.1	118 41.4	+ 4 07.7	13 29.7	+21 54.7	259 52.0	-15 39.1	108 33.9	98	+13 42.9 +121
1	143 29.8	241 22.5	49.4	133 42.2	08.4	28 32.5	54.7	274 54.3	39.1	123 02.7	97	13 55.0 +121
2	158 32.3	256 22.2	49.6	148 43.1	09.2	43 35.3	54.8	289 56.7	39.1	137 31.4	96	14 07.1 +119
3	173 34.8	271 21.9	.. 49.9	163 43.9	.. 09.9	58 38.1	.. 54.8	304 59.0	.. 39.2	152 00.0	96	14 19.0 +119
4	188 37.2	286 21.6	50.2	178 44.8	10.6	73 40.9	54.9	320 01.4	39.2	166 28.6	95	14 30.9 +119
5	203 39.7	301 21.3	50.4	193 45.6	11.4	88 43.7	55.0	335 03.7	39.2	180 57.1	95	14 42.8 +117
6	218 42.1	316 21.0	-19 50.7	208 46.4	+ 4 12.1	103 46.5	+21 55.0	350 06.0	-15 39.2	195 25.6	93	+14 54.5 +117
7	233 44.6	331 20.7	51.0	223 47.3	12.9	118 49.3	55.1	5 08.4	39.3	209 53.9	93	15 06.2 +115
8	248 47.1	346 20.5	51.2	238 48.1	13.6	133 52.1	55.1	20 10.7	39.3	224 22.2	92	15 17.7 +115
9	263 49.5	1 20.2	.. 51.5	253 48.9	.. 14.3	148 54.9	.. 55.2	35 13.0	.. 39.3	238 50.4	92	15 29.2 +115
10	278 52.0	16 19.9	51.8	268 49.8	15.1	163 57.7	55.2	50 15.4	39.3	253 18.6	90	15 40.7 +113
11	293 54.5	31 19.6	52.0	283 50.6	15.8	179 00.5	55.3	65 17.7	39.4	267 46.6	90	15 52.0 +112
12	308 56.9	46 19.3	-19 52.3	298 51.4	+ 4 16.5	194 03.2	+21 55.3	80 20.1	-15 39.4	282 14.6	89	+16 03.2 +112
13	323 59.4	61 19.0	52.6	313 52.3	17.3	209 06.0	55.4	95 22.4	39.4	296 42.5	88	16 14.4 +111
14	339 01.9	76 18.7	52.8	328 53.1	18.0	224 08.8	55.5	110 24.7	39.4	311 10.3	88	16 25.5 +109
15	354 04.3	91 18.4	.. 53.1	343 53.9	.. 18.7	239 11.6	.. 55.5	125 27.1	.. 39.5	325 38.1	86	16 36.4 +109
16	9 06.8	106 18.1	53.3	358 54.8	19.5	254 14.4	55.6	140 29.4	39.5	340 05.7	86	16 47.3 +108
17	24 09.3	121 17.8	53.6	13 55.6	20.2	269 17.2	55.6	155 31.7	39.5	354 33.3	85	16 58.1 +107
18	39 11.7	136 17.5	-19 53.9	28 56.4	+ 4 20.9	284 20.0	+21 55.7	170 34.1	-15 39.5	9 00.8	85	+17 08.8 +106
19	54 14.2	151 17.2	54.1	43 57.3	21.7	299 22.8	55.7	185 36.4	39.6	23 28.3	83	17 19.4 +105
20	69 16.6	166 16.9	54.4	58 58.1	22.4	314 25.6	55.8	200 38.8	39.6	37 55.6	83	17 29.9 +104
21	84 19.1	181 16.6	.. 54.6	73 59.0	.. 23.1	329 28.4	.. 55.8	215 41.1	.. 39.6	52 22.9	82	17 40.3 +103
22	99 21.6	196 16.3	54.9	88 59.8	23.9	344 31.2	55.9	230 43.4	39.6	66 50.1	81	17 50.6 +102
23	114 24.0	211 16.0	55.2	104 00.6	24.6	359 33.9	56.0	245 45.8	39.7			

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS						
	GHA	Dec.	No.	Name	SHA	Dec.								Sun's Low'r Limb	Venus	Mars				
										28	29	30	31				Add	Add	Add	
h	°	'					N	h	m	h	m	h	m	h	m	Alt.	°	'	°	'
28 0	176 47.4	-18 27.2	7	Acamar	315 51.4	-40 29.2	72	11 03	6 05	8 26	7 59	7 18	□							
1	191 47.3	26.6	5	Achernar	335 59.3	-57 28.1	70	10 06	6 03	8 33	8 15	7 51	7 01							
2	206 47.2	25.9	30	Acrux	173 58.0	-62 50.9	68	9 33	6 02	8 38	8 27	8 14	7 55							
3	221 47.0	25.3	19	Adhara	255 46.5	-28 54.7	66	9 09	6 00	8 43	8 38	8 33	8 27							
4	236 46.9	24.6	10	Aldebaran	291 39.4	+16 25.3	64	8 51	5 58	8 47	8 47	8 48	8 52							
5	251 46.8	24.0					62	8 35	5 57	8 50	8 54	9 00	9 11							
6	266 46.7	-18 23.3	32	Alioth	166 58.6	+56 11.8	60	8 22	5 56	8 53	9 01	9 11	9 27							
7	281 46.5	22.7	34	Alkaid	153 33.1	+49 31.8	58	8 11	5 53	8 56	9 07	9 21	9 40							
8	296 46.4	22.0	55	Al Na'ir	28 38.9	-47 10.8	56	8 02	5 53	8 58	9 12	9 29	9 52							
9	311 46.3	21.4	15	Alnilam	276 30.5	-1 13.8	54	7 53	5 51	9 00	9 17	9 37	10 02							
10	326 46.2	20.7	25	Alphard	218 38.7	-8 27.9	52	7 46	5 49	9 02	9 21	9 43	10 11							
11	341 46.0	20.1					50	7 39	5 47	9 04	9 25	9 49	10 20							
12	356 45.9	-18 19.4	41	Alphecca	126 48.1	+26 51.6	45	7 24	5 43	9 08	9 34	10 03	10 37							
13	11 45.8	18.8	1	Alpheratz	358 29.0	+28 50.7	40	7 12	5 39	9 11	9 41	10 13	10 51							
14	26 45.7	18.1	51	Altair	62 51.2	+8 44.9	35	7 02	5 35	9 14	9 47	10 23	11 04							
15	41 45.6	17.5	2	Ankaa	353 58.9	-42 33.1	30	6 52	5 30	9 17	9 52	10 31	11 15							
16	56 45.4	16.8	42	Antares	113 20.1	-26 20.0	20	6 37	5 21	9 22	10 02	10 45	11 33							
17	71 45.3	16.2					10	6 23	5 10	9 26	10 10	10 58	11 49							
18	86 45.2	-18 15.5	37	Arcturus	146 35.6	+19 24.6	0	6 10	4 57	9 29	10 18	11 10	12 05							
19	101 45.1	14.9	43	Atria	109 01.6	-68 56.7	10	5 56	4 41	9 33	10 26	11 22	12 20							
20	116 45.0	14.2	22	Avior	234 35.4	-59 22.0	20	5 42	4 21	9 37	10 35	11 35	12 37							
21	131 44.8	13.5	13	Bellatrix	279 18.7	+6 18.6	30	5 25	3 54	9 42	10 45	11 50	12 56							
22	146 44.7	12.9	16	Betelg'se	271 48.4	+7 24.0	35	5 16	3 37	9 45	10 51	11 58	13 07							
23	161 44.6	12.2					40	5 04	3 14	9 48	10 57	12 08	13 20							
			17	Canopus	264 15.1	-52 40.4	45	4 51	2 44	9 52	11 05	12 20	13 35							
			12	Capella	281 38.8	+45 57.4	50	4 35	1 56	9 56	11 14	12 34	13 54							
			53	Deneb	50 01.8	+45 07.2	52	4 28	1 25	9 58	11 19	12 41	14 03							
			28	Denebola	183 18.0	+14 49.1	54	4 19	1 11	10 01	11 24	12 48	14 13							
			4	Diphda	349 39.8	-18 14.0	56	4 09	1 03	10 03	11 29	12 57	14 25							
							58	3 59	1 06	10 06	11 35	13 06	14 38							
			27	Dubhe	194 44.5	+61 59.3	60	3 46	1 09	10 09	11 42	13 17	14 53							
			14	Elnath	279 07.6	+28 34.4	S													
			47	Eltanin	91 06.9	+51 29.1														
			54	Enif	34 30.4	+9 40.1														
			56	Fomalhaut	16 12.4	-29 51.7														
							N	h	m	h	m	h	m	h	m					
			31	Gacrux	172 49.5	-56 51.6	72	13 24	18 25	23 44	26 11	2 11	□							
			29	Gienah	176 37.2	-17 17.7	70	14 21	18 27	23 31	25 41	1 41	4 22							
			35	Hadar	149 50.0	-60 09.3	68	14 54	18 28	23 20	25 19	1 19	3 31							
			6	Hamal	328 50.2	+23 15.2	66	15 18	18 29	23 11	25 02	1 02	2 59							
			48	Kaus Aust.	84 42.1	-34 24.4	64	15 37	18 31	23 04	24 48	0 48	2 35							
							62	15 52	18 32	22 58	24 36	0 36	2 17							
			40	Kochab	137 17.9	+74 19.9	60	16 05	18 34	22 52	24 26	0 26	2 02							
			57	Markab	14 22.2	+14 57.9	58	16 16	18 35	22 48	24 18	0 18	1 49							
			8	Menkar	315 00.7	+3 54.9	56	16 25	18 36	22 43	24 10	0 10	1 38							
			36	Menkent	148 59.2	-36 09.0	54	16 34	18 38	22 40	24 03	0 03	1 28							
			24	Miapl'dus	221 48.3	-69 32.0	52	16 41	18 39	22 36	23 57	25 20	1 20							
							50	16 48	18 40	22 33	23 52	25 12	1 12							
			9	Mirfak	309 42.9	+49 42.5	45	17 03	18 45	22 26	23 40	24 56	0 56							
			50	Nunki	76 52.8	-26 21.3	40	17 15	18 48	22 21	23 31	24 42	0 42							
			52	Peacock	54 28.6	-56 52.8	35	17 25	18 52	22 16	23 23	24 31	0 31							
			21	Pollux	244 20.8	+28 08.1	30	17 34	18 56	22 12	23 15	24 21	0 21							
			20	Procyon	245 45.1	+5 20.4	20	17 50	19 06	22 05	23 03	24 04	0 04							
							10	18 04	19 17	21 58	22 53	23 49	24 49							
			46	R'alhague	96 47.3	+12 35.3	0	18 17	19 29	21 52	22 42	23 35	24 32							
			26	Regulus	208 29.7	+12 11.0	10	18 30	19 44	21 46	22 32	23 22	24 15							
			11	Rigel	281 53.9	-8 15.2	20	18 44	20 04	21 40	22 22	23 07	23 57							
			38	Rigel Kent.	140 51.7	-60 39.0	30	19 00	20 30	21 33	22 10	22 51	23 37							
			44	Sabik	103 02.9	-15 40.3	35	19 10	20 47	21 29	22 03	22 41	23 25							
							40	19 21	21 10	21 24	21 55	22 30	23 11							
			3	Schedar	350 30.8	+56 17.8	45	19 34	21 39	21 19	21 46	22 17	22 55							
			45	Shaula	97 21.6	-37 04.3	50	19 50	22 25	21 13	21 35	22 01	22 35							
			18	Sirius	259 11.9	-16 39.3	52	19 57	22 54	21 10	21 30	21 54	22 26							
			33	Spica	159 17.3	-10 55.8	54	20 06	24 00	21 06	21 24	21 46	22 15							
			23	Suhail	223 24.2	-43 15.1	56	20 15	24 00	21 03	21 18	21 37	22 03							
							58	20 26	24 00	20 59	21 11	21 27	21 50							
			49	Vega	81 08.9	+38 44.3	60	20 38	24 00	20 55	21 03	21 15	21 34							
			39	Zub'g'bi	137 53.9	-15 51.5	S													
																	</			

G M T	T	VENUS -4.0			MARS 1.2			JUPITER -2.2			SATURN 0.7			MOON			
		GHA	GHA	Dec.	GHA	GHA	Dec.	GHA	GHA	Dec.	GHA	GHA	Dec.	GHA	code	Dec.	code
h	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
31	0	129 26.5	226 15.7	-19 55.4	119 01.5	+ 4 25.4	14 36.7	+21 56.0	260 48.1	-15 39.7	95 44.2	79	+18 10.9	+100			
1	1	144 29.0	241 15.4	55.7	134 02.3	26.1	29 39.5	56.1	275 50.4	39.7	110 11.1	79	18 20.9	+ 99			
2	2	159 31.4	256 15.1	55.9	149 03.1	26.8	44 42.3	56.1	290 52.8	39.7	124 38.0	78	18 30.8	+ 97			
3	3	174 33.9	271 14.8	55.9	164 04.0	27.6	59 45.1	56.2	305 55.1	39.7	139 04.8	77	18 40.5	+ 97			
4	4	189 36.4	286 14.5	56.4	179 04.8	28.3	74 47.9	56.2	320 57.5	39.8	153 31.5	76	18 50.2	+ 95			
5	5	204 38.8	301 14.2	56.7	194 05.6	29.0	89 50.7	56.3	335 59.8	39.8	167 58.1	76	18 59.7	+ 95			
6	6	219 41.3	316 13.9	-19 56.9	209 06.5	+ 4 29.8	104 53.5	+21 56.3	351 02.1	-15 39.8	182 24.7	74	+19 09.2	+ 93			
7	7	234 43.7	331 13.6	57.2	224 07.3	30.5	119 56.3	56.4	6 04.5	39.8	196 51.1	74	19 18.5	+ 92			
8	8	249 46.2	346 13.3	57.4	239 08.1	31.2	134 59.1	56.5	21 06.8	39.9	211 17.5	73	19 27.7	+ 91			
9	9	264 48.7	1 13.0	57.7	254 09.0	32.0	150 01.8	56.5	36 09.2	39.9	225 43.8	72	19 36.8	+ 90			
10	10	279 51.1	16 12.7	57.9	269 09.8	32.7	165 04.6	56.6	51 11.5	39.9	240 10.0	72	19 45.8	+ 89			
11	11	294 53.6	31 12.3	58.2	284 10.6	33.4	180 07.4	56.6	66 13.9	39.9	254 36.2	70	19 54.7	+ 87			
12	12	309 56.1	46 12.0	-19 58.4	299 11.5	+ 4 34.2	195 10.2	+21 56.7	81 16.2	-15 40.0	269 02.2	70	+20 03.4	+ 86			
13	13	324 58.5	61 11.7	58.7	314 12.3	34.9	210 13.0	56.7	96 18.5	40.0	283 28.2	69	20 12.0	+ 85			
14	14	340 01.0	76 11.4	58.9	329 13.1	35.6	225 15.8	56.8	111 20.9	40.0	297 54.1	69	20 20.5	+ 84			
15	15	355 03.5	91 11.1	59.2	344 14.0	36.4	240 18.6	56.8	126 23.2	40.0	312 20.0	67	20 28.9	+ 83			
16	16	10 05.9	106 10.8	59.4	359 14.8	37.1	255 21.4	56.9	141 25.6	40.1	326 45.7	67	20 37.2	+ 81			
17	17	25 08.4	121 10.5	59.7	14 15.6	37.8	270 24.1	57.0	156 27.9	40.1	341 11.4	66	20 45.3	+ 80			
18	18	40 10.9	136 10.2	-19 59.9	29 16.5	+ 4 38.6	285 26.9	+21 57.0	171 30.2	-15 40.1	355 37.0	65	+20 53.3	+ 78			
19	19	55 13.3	151 09.8	20 00.2	44 17.3	39.3	300 29.7	57.1	186 32.6	40.1	10 02.5	64	21 01.1	+ 78			
20	20	70 15.8	166 09.5	00.4	59 18.1	40.0	315 32.5	57.1	201 34.9	40.2	24 27.9	64	21 08.9	+ 76			
21	21	85 18.2	181 09.2	00.6	74 19.0	40.8	330 35.3	57.2	216 37.3	40.2	38 53.3	63	21 16.5	+ 74			
22	22	100 20.7	196 08.9	00.9	89 19.8	41.5	345 38.1	57.2	231 39.6	40.2	53 18.6	62	21 23.9	+ 74			
23	23	115 23.2	211 08.6	01.1	104 20.7	42.2	0 40.9	57.3	246 42.0	40.2	67 43.8	62	21 31.3	+ 72			
1	1	130 25.6	226 08.3	-20 01.4	119 21.5	+ 4 43.0	15 43.6	+21 57.3	261 44.3	-15 40.2	82 09.0	60	+21 38.5	+ 70			
2	2	145 28.1	241 07.9	01.6	134 22.3	43.7	30 46.4	57.4	276 46.6	40.3	96 34.0	61	21 45.5	+ 69			
3	3	160 30.6	256 07.6	01.8	149 23.2	44.4	45 49.2	57.4	291 49.0	40.3	110 59.1	61	21 52.4	+ 68			
4	4	175 33.0	271 07.3	02.1	164 24.0	45.2	60 52.0	57.5	306 51.3	40.3	125 24.0	58	21 59.2	+ 67			
5	5	190 35.5	286 07.0	02.3	179 24.8	45.9	75 54.8	57.6	321 53.7	40.3	139 48.8	58	22 05.9	+ 65			
6	6	205 38.0	301 06.6	02.6	194 25.7	46.6	90 57.6	57.6	336 56.0	40.4	154 13.6	58	22 12.4	+ 63			
7	7	220 40.4	316 06.3	-20 02.8	209 26.5	+ 4 47.4	106 00.4	+21 57.7	351 58.4	-15 40.4	168 38.4	56	+22 18.7	+ 62			
8	8	235 42.9	331 06.0	03.0	224 27.3	48.1	121 03.1	57.7	7 00.7	40.4	183 03.0	56	22 24.9	+ 61			
9	9	250 45.4	346 05.7	03.3	239 28.2	48.8	136 05.9	57.8	22 03.1	40.4	197 27.6	55	22 31.0	+ 59			
10	10	265 47.8	1 05.3	03.5	254 29.0	49.5	151 08.7	57.8	37 05.4	40.4	211 52.1	55	22 36.9	+ 58			
11	11	280 50.3	16 05.0	03.7	269 29.8	50.3	166 11.5	57.9	52 07.7	40.5	226 16.6	54	22 42.7	+ 56			
12	12	295 52.7	31 04.7	04.0	284 30.7	51.0	181 14.3	57.9	67 10.1	40.5	240 41.0	54	22 48.3	+ 55			
13	13	310 55.2	46 04.4	-20 04.2	299 31.5	+ 4 51.7	196 17.1	+21 58.0	82 12.4	-15 40.5	255 05.4	52	+22 53.8	+ 53			
14	14	325 57.7	61 04.0	04.4	314 32.3	52.5	211 19.8	58.0	97 14.8	40.5	269 29.6	53	22 59.1	+ 52			
15	15	341 00.1	76 03.7	04.7	329 33.2	53.2	226 22.6	58.1	112 17.1	40.6	283 53.9	51	23 04.3	+ 50			
16	16	356 02.6	91 03.4	04.9	344 34.0	53.9	241 25.4	58.1	127 19.5	40.6	298 18.0	51	23 09.3	+ 49			
17	17	11 05.1	106 03.0	05.1	359 34.8	54.7	256 28.2	58.2	142 21.8	40.6	312 42.1	51	23 14.2	+ 47			
18	18	26 07.5	121 02.7	05.3	14 35.7	55.4	271 31.0	58.3	157 24.2	40.6	327 06.2	50	23 18.9	+ 46			
19	19	41 10.0	136 02.4	-20 05.6	29 36.5	+ 4 56.1	286 33.8	+21 58.3	172 26.5	-15 40.7	341 30.2	50	+23 23.5	+ 44			
20	20	56 12.5	151 02.0	05.8	44 37.3	56.9	301 36.5	58.4	187 28.9	40.7	355 54.2	49	23 27.9	+ 42			
21	21	71 14.9	166 01.7	06.0	59 38.2	57.6	316 39.3	58.4	202 31.2	40.7	10 18.1	48	23 32.1	+ 41			
22	22	86 17.4	181 01.4	06.3	74 39.0	58.3	331 42.1	58.5	217 33.5	40.7	24 41.9	48	23 36.2	+ 39			
23	23	101 19.9	196 01.0	06.5	89 39.8	59.0	346 44.9	58.5	232 35.9	40.7	39 05.7	48	23 40.1	+ 38			
24	24	116 22.3	211 00.7	06.7	104 40.7	4 59.8	1 47.7	58.6	247 38.2	40.8	53 29.5	47	23 43.9	+ 36			
2	2	131 24.8	226 00.4	-20 06.9	119 41.5	+ 5 00.5	16 50.5	+21 58.6	262 40.6	-15 40.8	67 53.2	47	+23 47.5	+ 35			
1	1	146 27.2	241 00.0	07.1	134 42.3	01.2	31 53.2	58.7	277 42.9	40.8	82 16.9	46	23 51.0	+ 33			
2	2	161 29.7	255 59.7	07.4	149 43.2	02.0	46 56.0	58.7	292 45.3	40.8	96 40.5	46	23 54.3	+ 31			
3	3	176 32.2	270 59.4	07.6	164 44.0	02.7	61 58.8	58.8	307 47.6	40.9	111 04.1	45	23 57.4	+ 30			
4	4	191 34.6	285 59.0	07.8	179 44.8	03.4	77 01.6	58.8	322 50.0	40.9	125 27.6	45	24 00.4	+ 28			
5	5	206 37.1	300 58.7	08.0	194 45.7	04.2	92 04.4	58.9	337 52.3	40.9	139 51.1	45	24 03.2	+ 26			
6	6	221 39.6	315 58.3	-20 08.3	209 46.5	+ 5 04.9	107 07.1	+21 59.0	352 54.7	-15 40.9	154 14.6	45	+24 05.8	+ 25			
7	7	236 42.0	330 58.0	08.5	224 47.3	05.6	122 09.9	59.0	7 57.0	40.9	168 38.1	44	24 08.3	+ 23			
8	8	251 44.5	345 57.7	08.7	239 48.2	06.3	137 12.7	59.1	22 59.4	41.0	183 01.5	44	24 10.6	+ 21			
9	9	266 47.0	0 57.3	08.9	254 49.0	07.1	152 15.5	59.1	38 01.7	41.0	197 24.9	44	24 12.7	+ 20			
10	10	281 49.4	15 57.0	09.1	269 49.8	07.8	167 18.3	59.2	53 04.1	41.0	211 48.3	43	24 14.7	+ 18			
11	11	296 51.9	30 56.6	09.3	284 50.7	08.5	182 21.0	59.2	68 06.4	41.0	226 11.6	43	24 16.5	+ 17			
12	12	311 54.4	45 56.3	-20 09.6	299 51.5	+ 5 09.3	197 23.8	+21 59.3	83 08.8	-15 41.0	240 34.9	43	+24 18.2	+ 14			
13	13	326 56.8	60 55.9	09.8	314 52.3	10.0	212 26.6	59.3	98 11.1	41.1	254 58.2	43	24 19.6	+ 14			
14	14	341 59.3	75 55.6	10.0	329 53.2	10.7	227 29.4	59.4	113 13.5	41.1	269 21.5	43	24 21.0	+ 11			
15	15	357 01.7	90 55.2	10.2	344 54.0	11.5	242 32.2	59.4	128 15.8	41.1	283 44.8	42	24 22.1	+ 10			
16	16	12 04.2	105 54.9	10.4	359 54.8	12.2	257 34.9	59.5	143 18.2	41.1	298 08.0	43	24 23.1	+ 8			
17	17	27 06.7	120 54.5	10.6	14 55.7	12.9	272 37.7	59.5	158 20.5	41.2	312 31.3	42	24 23.9	+ 6			
18	18	42 09.1	135 54.2	-20 10.8	29 56.5	+ 5 13.6	287 40.5	+21 59.6	173 22.9	-15 41.2	326 54.5	42	+24 24.5	+ 5			
19	19	57 11.6	150 53.8	11.1	44 57.3	14.4	302 43.3	59.6	188 25.2	41.2	341 17.7	42	24 25.0	+ 3			
20	20	72 14.1	165 53.5	11.3	59 58.2	15											

G M T	VENUS -4.0			MARS 1.2			JUPITER -2.2			SATURN 0.7			MOON			
	GHA	Dec.		GHA	Dec.		GHA	Dec.		GHA	Dec.		GHA	code	Dec.	code
3	h	o	'	o	'	"	o	'	"	o	'	"	o	'	"	'
0	132 23.9	225 52.1	-20 12.1	120 01.5	+ 5 18.0		17 57.2	+21 59.9		263 37.0	-15 41.3		53 13.7	42 +24 24.8	- 5	
1	147 26.4	240 51.7	12.3	135 02.3	18.7		32 59.9	22 00.0		278 39.3	41.3		67 36.9	42 24 24.3	- 7	
2	162 28.8	255 51.4	12.5	150 03.2	19.5		48 02.7	00.0		293 41.7	41.3		82 00.1	43 24 23.6	- 9	
3	177 31.3	270 51.0	.. 12.5	165 04.0	.. 20.2		63 05.5	.. 00.1		308 44.0	.. 41.4		96 23.4	42 -24 22.7	- 10	
4	192 33.8	285 50.7	12.9	180 04.8	20.9		78 08.3	00.1		323 46.4	41.4		110 46.6	42 24 21.7	- 13	
5	207 36.2	300 50.3	13.1	195 05.7	21.6		93 11.0	00.2		338 48.7	41.4		125 09.8	43 24 20.4	- 13	
6	222 38.7	315 50.0	-20 13.3	210 06.5	+ 5 22.4		108 13.8	+22 00.2		353 51.1	-15 41.4		139 33.1	42 +24 19.1	- 16	
7	237 41.2	330 49.6	13.5	225 07.3	23.1		123 16.6	00.3		8 53.4	41.4		153 56.3	43 24 17.5	- 17	
8	252 43.6	345 49.2	13.7	240 08.2	23.8		138 19.4	00.3		23 55.8	41.5		168 19.6	43 24 15.8	- 19	
9	267 46.1	0 48.9	.. 13.9	255 09.0	.. 24.5		153 22.1	.. 00.4		38 58.1	.. 41.5		182 42.9	44 -24 13.9	- 20	
10	282 48.6	15 48.5	14.1	270 09.8	25.3		168 24.9	00.4		54 00.5	41.5		197 06.3	43 24 11.9	- 23	
11	297 51.0	30 48.2	14.3	285 10.7	26.0		183 27.7	00.5		69 02.8	41.5		211 29.6	44 24 09.6	- 23	
12	312 53.5	45 47.8	-20 14.5	300 11.5	+ 5 26.7		198 30.5	+22 00.5		84 05.2	-15 41.5		225 53.0	44 +24 07.3	- 26	
13	327 56.0	60 47.4	14.7	315 12.3	27.5		213 33.2	00.6		99 07.5	41.6		240 16.4	44 24 04.7	- 27	
14	342 58.4	75 47.1	14.9	330 13.2	28.2		228 36.0	00.6		114 09.9	41.6		254 39.8	45 24 02.0	- 29	
15	358 00.9	90 46.7	.. 15.1	345 14.0	.. 28.9		243 38.8	.. 00.7		129 12.3	.. 41.6		269 03.5	45 -23 59.1	- 30	
16	13 03.3	105 46.4	15.3	0 14.8	29.6		258 41.6	00.7		144 14.6	41.6		283 26.8	45 23 56.1	- 32	
17	28 05.5	120 46.0	15.5	15 15.7	30.4		273 44.3	00.8		159 17.0	41.6		297 50.3	45 23 52.9	- 34	
18	43 08.3	135 45.6	-20 15.7	30 16.5	+ 5 31.1		288 47.1	+22 00.8		174 19.3	-15 41.7		312 13.8	46 +23 49.5	- 35	
19	58 10.7	150 45.3	15.9	45 17.3	31.8		303 49.9	00.9		189 21.7	41.7		326 37.4	47 23 46.0	- 37	
20	73 13.2	165 44.9	16.1	60 18.2	32.5		318 52.7	00.9		204 24.0	41.7		341 01.1	47 23 42.3	- 38	
21	88 15.7	180 44.5	.. 16.3	75 19.0	.. 33.3		333 55.4	.. 01.0		219 26.4	.. 41.7		355 24.8	47 -23 38.5	- 40	
22	103 18.1	195 44.2	16.5	90 19.8	34.0		348 58.2	01.0		234 28.7	41.7		9 48.5	48 23 34.5	- 42	
23	118 20.6	210 43.8	16.7	105 20.7	34.7		4 01.0	01.1		249 31.1	41.8		24 12.3	48 23 30.3	- 43	
4	0	133 23.1	225 43.4	-20 16.9	120 21.5	+ 5 35.4	19 03.8	+22 01.1		264 33.4	-15 41.8		38 36.1	49 +23 26.0	- 45	
1	148 25.5	240 43.1	17.0	135 22.3	36.2		34 06.5	01.2		279 35.8	41.8		53 00.0	49 23 21.5	- 47	
2	163 28.0	255 42.7	17.2	150 23.1	36.9		49 09.3	01.3		294 38.2	41.8		67 23.9	50 23 16.8	- 48	
3	178 30.5	270 42.3	.. 17.4	165 24.0	.. 37.6		64 12.1	.. 01.3		309 40.5	.. 41.8		81 47.9	50 -23 12.0	- 49	
4	193 32.9	285 41.9	17.6	180 24.8	38.3		79 14.8	01.4		324 42.9	41.9		96 11.9	51 23 07.1	- 51	
5	208 35.4	300 41.6	17.8	195 25.6	39.1		94 17.6	01.4		339 45.2	41.9		110 36.0	51 23 02.0	- 53	
6	223 37.8	315 41.2	-20 18.0	210 26.5	+ 5 39.8		109 20.4	+22 01.5		354 47.6	-15 41.9		125 00.1	52 +22 56.7	- 54	
7	238 40.3	330 40.8	18.2	225 27.3	40.5		124 23.2	01.5		9 49.9	41.9		139 24.3	53 22 51.3	- 55	
8	253 42.8	345 40.4	18.4	240 28.1	41.2		139 25.9	01.6		24 52.3	41.9		153 48.6	53 22 45.8	- 57	
9	268 45.2	0 40.1	.. 18.5	255 29.0	.. 42.0		154 28.7	.. 01.6		39 54.6	.. 42.0		168 12.9	54 -22 40.1	- 59	
10	283 47.7	15 39.7	18.7	270 29.8	42.7		169 31.5	01.7		54 57.0	42.0		182 37.3	54 22 34.2	- 60	
11	298 50.2	30 39.3	18.9	285 30.6	43.4		184 34.2	01.7		69 59.4	42.0		197 01.7	55 22 28.2	- 62	
12	313 52.6	45 38.9	-20 19.1	300 31.5	+ 5 44.1		199 37.0	+22 01.8		85 01.7	-15 42.0		211 26.2	56 +22 22.0	- 63	
13	328 55.1	60 38.6	19.3	315 32.3	44.9		214 39.8	01.8		100 04.1	42.0		225 50.8	56 22 15.7	- 64	
14	343 57.6	75 38.2	19.4	330 33.1	45.6		229 42.5	01.9		115 06.4	42.1		240 15.4	57 22 09.3	- 66	
15	359 00.0	90 37.8	.. 19.6	345 34.0	.. 46.3		244 45.3	.. 01.9		130 08.8	.. 42.1		254 40.1	58 -22 02.7	- 67	
16	14 02.5	105 37.4	19.8	0 34.8	47.0		259 48.1	02.0		145 11.1	42.1		269 04.9	59 21 56.0	- 69	
17	29 05.0	120 37.1	20.0	15 35.6	47.8		274 50.9	02.0		160 13.5	42.1		283 29.8	59 21 49.1	- 70	
18	44 07.4	135 36.7	-20 20.2	30 36.5	+ 5 48.5		289 53.6	+22 02.1		175 15.9	-15 42.1		297 54.7	60 +21 42.1	- 71	
19	59 09.9	150 36.3	20.3	45 37.3	49.2		304 56.4	02.1		190 18.2	42.2		312 19.7	61 21 35.0	- 73	
20	74 12.3	165 35.9	20.5	60 38.1	49.9		319 59.2	02.2		205 20.6	42.2		326 44.8	61 21 27.7	- 74	
21	89 14.8	180 35.5	.. 20.7	75 39.0	.. 50.6		335 01.9	.. 02.2		220 22.9	.. 42.2		341 09.9	63 -21 20.3	- 76	
22	104 17.3	195 35.1	20.9	90 39.8	51.4		350 04.7	02.3		235 25.3	42.2		355 35.2	63 21 12.7	- 77	
23	119 19.7	210 34.8	21.0	105 40.6	52.1		5 07.5	02.3		250 27.7	42.2		10 00.5	63 21 05.0	- 78	
5	0	134 22.2	225 34.4	-20 21.2	120 41.5	+ 5 52.8	20 10.2	+22 02.4		265 30.0	-15 42.2		24 25.8	65 +20 57.2	- 79	
1	149 24.7	240 34.0	21.4	135 42.3	53.5		35 13.0	02.4		280 32.4	42.3		38 51.3	65 20 49.3	- 81	
2	164 27.1	255 33.6	21.5	150 43.1	54.3		50 15.8	02.5		295 34.7	42.3		53 16.8	67 20 41.2	- 82	
3	179 29.6	270 33.2	.. 21.7	165 43.9	.. 55.0		65 18.5	.. 02.5		310 37.1	.. 42.3		67 42.5	67 -20 33.0	- 83	
4	194 32.1	285 32.8	21.9	180 44.8	55.7		80 21.3	02.6		325 39.5	42.3		82 08.2	68 20 24.7	- 85	
5	209 34.5	300 32.4	22.0	195 45.6	56.4		95 24.1	02.6		340 41.8	42.3		96 34.0	68 20 16.2	- 85	
6	224 37.0	315 32.1	-20 22.2	210 46.4	+ 5 57.1		110 26.8	+22 02.7		355 44.2	-15 42.4		110 59.8	70 +20 07.7	- 87	
7	239 39.4	330 31.7	22.4	225 47.3	57.9		125 29.6	02.7		10 46.5	42.4		125 25.8	70 19 59.0	- 88	
8	254 41.9	345 31.3	22.5	240 48.1	58.6		140 32.4	02.8		25 48.9	42.4		139 51.8	71 19 50.2	- 90	
9	269 44.4	0 30.9	.. 22.7	255 48.9	+ 5 59.3		155 35.1	.. 02.8		40 51.3	.. 42.4		154 17.9	73 -19 41.2	- 90	
10	284 46.8	15 30.5	22.9	270 49.8	6 00.0		170 37.9	02.9		55 53.6	42.4		168 44.2	72 19 32.2	- 92	
11	299 49.3	30 30.1	23.0	285 50.6	00.8		185 40.7	02.9		70 56.0	42.5		183 10.4	74 19 23.0	- 93	
12	314 51.8	45 29.7	-20 23.2	300 51.4	+ 6 01.5		200 43.4	+22 03.0		85 58.3	-15 42.5		197 36.8	75 +19 13.7	- 94	
13	329 54.2	60 29.3	23.4	315 52.3	02.2		215 46.2	03.0		101 00.7	42.5		212 03.3	75 19 04.3	- 95	
14	344 56.7	75 28.9	23.5	330 53.1	02.9		230 49.0	03.1		116 03.1	42.5		226 29.8	77 18 54.8	- 96	
15	359 59.2	90 28.5	.. 23.7	345 53.9	.. 03.6		245 51.7	.. 03.1		131 05.4	.. 42.5		240 56.5	77 -18 45.2	- 97	
16	15 01.6	105 28.1	23.9	0 54.7	04.4		260 54.5	03.2		146 07.8	42.5		255 23.2	78 18 35.5	- 98	
17	30 04.1	120 27.8	24.0	15 55.6	05.1		275 57.2	03.2		161 10.1	42.6		269 50.0	79 18 25.7	- 99	
18	45 06.6	135 27.4	-20 24.2	30 56.4	+ 6 05.8		291 00.0	+22 03.3		176 12.5	-15 42.6		284 16.9	80 +18 15.8	-101	
19	60 09.0	150 27.0	24.3	45 57.2	06.5		306 02.8	03.3		191 14.9	42.6		298 43.9	81 18 05.7	-101	
20	75 11.5	165 26.6	24.5	60 58.1	07.2		321 05.5	03.4		206 17.2	42.6		313 11.0	82 17 55.6	-103	
21	90 13.9	180 26.2	.. 24.6	75 58.9	.. 08.0		336 08.3	.. 03.4		221 19.6	.. 42.6		327 38.2	82 -17 45.3	-103	
22	105 16.4	195 25.8	24.8	90 59.7	08.7		351 11.1	03.5		236 22.0	42.6		342 05.4	84 17		

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.	No.	Name	SHA	Dec.				3	4	5	6	Alt.	Sun's Lower Limb Add	Venus Add	Mars Add		
h	°	'		°	'		N	h	m	h	m	h	m	h	m				
3 0	176 32.9	-16 48.5	7	Acamar	315 51.4	-40 29.2	72	10 09	5 46	□	□	□	14 17						
1	191 32.9	47.8	5	Achernar	335 59.3	-57 28.1	70	9 33	5 46	□	□	12 02	14 49						
2	206 32.8	47.0	30	Acrux	173 57.9	-62 51.0	68	9 08	5 46	□	□	12 59	15 13						
3	221 32.7	46.3	19	Adhara	255 46.6	-28 54.8	66	8 48	5 47	□	11 25	13 33	15 31						
4	236 32.6	45.6	10	Aldebaran	291 39.4	+16 25.3	64	8 33	5 46	10 29	12 07	13 57	15 45	0					
5	251 32.6	44.9					62	8 19	5 45	11 07	12 36	14 16	15 57	30	0.6	0.2	0.1		
6	266 32.5	-16 44.1	32	Alioth	166 58.6	+56 11.8	60	8 09	5 45	11 34	12 58	14 32	16 08	45	0.6	0.2	0.1		
7	281 32.4	43.4	34	Alkaid	153 33.0	+49 31.8	58	7 59	5 44	11 55	13 16	14 45	16 16	60	0.6	0.1	0.1		
8	296 32.4	42.7	55	Al Na'ir	28 38.9	-47 10.8	56	7 51	5 44	12 12	13 30	14 56	16 24	75	0.6	0.1	0.0		
9	311 32.3	42.0	15	Alnilam	276 30.5	-1 13.8	54	7 43	5 43	12 27	13 43	15 06	16 31	90	0.6	0.0	0.0		
10	326 32.2	41.2	25	Alphard	218 38.7	-8 28.0	52	7 36	5 41	12 40	13 54	15 15	16 37						
11	341 32.1	40.5					50	7 30	5 41	12 51	14 04	15 23	16 43						
12	356 32.1	-16 39.8	41	Alphecca	126 48.1	+26 51.6	45	7 17	5 38	13 14	14 25	15 40	16 55	Moon's Lower Limb					
13	11 32.0	39.0	1	Alpheratz	358 29.1	+28 50.7	40	7 07	5 35	13 33	14 42	15 53	17 05	Add					
14	26 31.9	38.3	51	Altair	62 51.2	+8 44.8	35	6 57	5 32	13 49	14 56	16 05	17 13	Alt.	3	4	5		
15	41 31.9	37.6	2	Ankaa	353 58.9	-42 33.1	30	6 49	5 28	14 03	15 08	16 15	17 20	0					
16	56 31.8	36.9	42	Antares	113 20.1	-26 20.1	20	6 35	5 20	14 26	15 29	16 32	17 33	4	18.7	18.5	18.1		
17	71 31.7	36.1					10	6 22	5 10	14 46	15 48	16 47	17 44	8	18.7	18.5	18.1		
18	86 31.7	-16 35.4	37	Arcturus	146 35.5	+19 24.6	0	6 10	4 58	15 05	16 05	17 01	17 54	12	18.7	18.4	18.1		
19	101 31.6	34.7	43	Atria	109 01.5	-68 56.7	10	5 58	4 44	15 23	16 21	17 15	18 05	16	18.7	18.4	18.0		
20	116 31.5	33.9	22	Avior	234 35.4	-59 22.0	20	5 46	4 26	15 44	16 40	17 30	18 16	20	18.6	18.4	18.0		
21	131 31.5	33.2	13	Bellatrix	279 18.7	+6 18.6	30	5 31	4 02	16 07	17 00	17 47	18 28	24	18.6	18.3	18.0		
22	146 31.4	32.5	16	Betelge'se	271 48.4	+7 24.0	35	5 22	3 46	16 20	17 12	17 57	18 35	28	18.5	18.2	17.9		
23	161 31.3	31.7					40	5 12	3 25	16 36	17 26	18 08	18 44	32	18.4	18.2	17.8		
4 0	176 31.3	-16 31.0	17	Canopus	264 15.1	-52 40.4	45	5 00	2 58	16 55	17 43	18 21	18 53	36	18.3	18.1	17.8		
1	191 31.2	30.2	12	Capella	281 38.8	+45 57.4	50	4 46	2 18	17 18	18 03	18 37	19 04	40	18.2	18.0	17.7		
2	206 31.1	29.5	53	Deneb	50 01.8	+45 07.1	52	4 39	1 54	17 29	18 12	18 45	19 10	44	18.1	17.9	17.6		
3	221 31.1	28.8	28	Denebola	183 17.9	+14 49.1	54	4 32	1 21	17 42	18 23	18 53	19 15	48	18.0	17.8	17.5		
4	236 31.0	28.0	4	Diphda	349 39.9	-18 14.0	56	4 23	1 11	17 56	18 35	19 02	19 22	52	17.8	17.7	17.4		
5	251 30.9	27.3					58	4 14	1 00	18 13	18 49	19 13	19 29	56	17.7	17.5	17.3		
6	266 30.9	-16 26.6	27	Dubhe	194 44.5	+61 59.3	60	4 03	0 43	18 34	19 06	19 25	19 37	60	17.6	17.4	17.2		
7	281 30.8	25.8	14	Elnath	279 07.7	+28 34.4	S							64	17.4	17.3	17.0		
8	296 30.7	25.1	47	Eltanin	91 06.8	+51 29.4								68	17.2	17.1	16.9		
9	311 30.7	24.3	54	Enif	34 30.4	+9 40.1								72	17.1	17.0	16.8		
10	326 30.6	23.6	56	Fomalhaut	16 12.4	-29 51.7	N							76	16.9	16.8	16.6		
11	341 30.6	22.9												80	16.8	16.7	16.5		
12	356 30.5	-16 22.1	31	Gacrux	172 49.4	-56 51.7	72	14 20	18 47	□	□	□	9 27	84	16.6	16.5	16.4		
13	11 30.4	21.4	29	Gienah	176 37.1	-17 17.7	70	14 56	18 46	□	□	9 47	8 53	88	16.4	16.3	16.2		
14	26 30.4	20.6	35	Hadar	149 50.0	-60 09.3	68	15 22	18 46	□	□	8 49	8 28	90	16.3	16.2	16.1		
15	41 30.3	19.9	6	Hamal	328 50.2	+23 15.2	66	15 41	18 45	□	8 22	8 14	8 09	Add to table, back cover					
16	56 30.3	19.1	48	Kaus Aust.	84 42.1	-34 24.4	64	15 56	18 45	7 11	7 39	7 49	7 53	Moon's Upper Limb					
17	71 30.2	18.4					62	16 09	18 45	6 33	7 10	7 29	7 40	Subtract					
18	86 30.1	-16 17.7	40	Kochab	137 17.8	+74 19.9	60	16 20	18 45	6 06	6 48	7 13	7 29	Alt.	3	4	5		
19	101 30.1	16.9	57	Markab	14 22.2	+14 57.9	58	16 30	18 47	5 45	6 30	6 59	7 19	0					
20	116 30.0	16.2	8	Menkar	315 00.8	+3 54.9	56	16 38	18 47	5 27	6 14	6 47	7 10	4	13.7	13.9	14.1		
21	131 30.0	15.4	36	Menkent	148 59.1	-36 09.0	54	16 46	18 48	5 12	6 01	6 37	7 03	8	13.7	13.9	14.1		
22	146 29.9	14.7	24	Miapl'dus	221 48.3	-69 32.0	52	16 52	18 48	5 00	5 50	6 27	6 56	12	13.8	13.9	14.2		
23	161 29.8	13.9					50	16 58	18 49	4 48	5 39	6 19	6 50	16	13.9	14.0	14.2		
5 0	176 29.8	-16 13.2	9	Mirfak	309 43.0	+49 42.5	45	17 11	18 52	4 25	5 18	6 01	6 36	20	14.0	14.1	14.3		
1	191 29.7	12.4	50	Nunki	76 52.8	-26 21.3	40	17 22	18 55	4 05	5 00	5 46	6 25	24	14.1	14.2	14.4		
2	206 29.7	11.7	52	Peacock	54 28.5	-56 52.8	35	17 31	18 57	3 50	4 46	5 34	6 15	28	14.2	14.3	14.4		
3	221 29.6	10.9	21	Pollux	244 20.8	+28 08.1	30	17 39	19 01	3 36	4 33	5 23	6 07	32	14.3	14.4	14.5		
4	236 29.6	10.2	20	Procyon	245 45.1	+5 20.4	20	17 53	19 08	3 12	4 11	5 04	5 52	36	14.4	14.5	14.6		
5	251 29.5	09.4					10	18 06	19 18	2 52	3 52	4 48	5 39	40	14.5	14.6	14.7		
6	266 29.4	-16 08.7	46	R'alhague	96 47.2	+12 35.3	0	18 17	19 29	2 33	3 34	4 32	5 27	44	14.6	14.7	14.8		
7	281 29.4	07.9	26	Regulus	208 29.7	+12 11.0	10	18 29	19 43	2 14	3 15	4 16	5 12	48	14.7	14.8	14.9		
8	296 29.3	07.2	11	Rigel	281 53.9	-8 15.2	20	18 42	20 01	1 53	2 56	4 00	5 02	52	14.8	14.9	15.0		
9	311 29.3	06.4	38	Rigel Kent.	140 51.6	-60 39.0	30	18 57	20 25	1 29	2 34	3 40	4 46	56	14.9	15.0	15.1		
10	326 29.2	05.7	44	Sabik	103 02.9	-15 40.3	35	19 05	20 40	1 15	2 20	3 29	4 38	60	15.1	15.1	15.2		
11	341 29.2	04.9					40	19 15	21 00	0 59	2 05	3 16	4 27	64	15.2	15.2	15.3		
12	356 29.1	-16 04.2	3	Schedar	350 30.9	+56 17.8	45	19 27	21 27	0 40	1 47	3 00	4 15	68	15.3	15.3	15.4		
13	11 29.1	03.4	45	Shaula	97 21.5	-37 04.3	50	19 41	22 06	0 16	1 24	2 41	4 01	72	15.4	15.4	15.5		
14	26 29.0	02.7	18	Sirius	259 12.0	-16 39.3	52	19 48	22 28	0 04	1 13	2 32	3 54	76	15.5	15.5	15.6		
15	41 29.0	01.9	33	Spica	159 17.														

G M T	VENUS -4.0			MARS 1.2			JUPITER -2.1			SATURN 0.7			MOON			
	GHA	Dec.		GHA	Dec.		GHA	Dec.		GHA	Dec.		GHA	code	Dec.	code
h	o	'	"	o	'	"	o	'	"	o	'	"	o	'	"	code
6	0	135 21.3	225 25.0	-20 25.1	121 01.4	+ 6 10.1	21 16.6	+22 03.6	266 26.7	-15 42.7	11 00.2	85 +17 14.1	-107			
1	150 23.8	240 24.6	25.3	136 02.2	10.8	36 19.4	03.6	281 29.0	42.7	25 27.7	86 17 03.4	-107				
2	165 26.3	255 24.2	25.4	151 03.1	11.6	51 22.1	03.7	296 31.4	42.7	39 55.3	87 16 52.7	-108				
3	180 28.7	270 23.8	25.6	166 03.9	12.3	66 24.9	03.7	311 33.8	42.7	54 23.0	88 16 41.9	-109				
4	195 31.2	285 23.4	25.7	181 04.7	13.0	81 27.6	03.8	326 36.1	42.8	68 50.8	89 16 31.0	-110				
5	210 33.7	300 23.0	25.9	196 05.5	13.7	96 30.4	03.8	341 38.5	42.8	83 18.7	90 16 20.0	-110				
6	225 36.1	315 22.6	-20 26.0	211 06.4	+ 6 14.4	111 33.2	+22 03.9	356 40.9	-15 42.8	97 46.6	91 +16 09.0	-112				
7	240 38.6	330 22.2	26.2	226 07.2	15.2	126 35.9	03.9	11 43.2	42.8	112 14.7	91 15 57.8	-112				
8	255 41.1	345 21.8	26.3	241 08.0	15.9	141 38.7	04.0	26 45.6	42.8	126 42.8	92 15 46.6	-113				
9	270 43.5	0 21.4	26.5	256 08.9	16.6	156 41.4	04.0	41 48.0	42.8	141 11.0	94 15 35.3	-114				
10	285 46.0	15 21.0	26.6	271 09.7	17.3	171 44.2	04.1	56 50.3	42.9	155 39.4	94 15 23.9	-115				
11	300 48.4	30 20.5	26.8	286 10.5	18.0	186 47.0	04.1	71 52.7	42.9	170 07.8	94 15 12.4	-115				
12	315 50.9	45 20.1	-20 26.9	301 11.4	+ 6 18.8	201 49.7	+22 04.2	86 55.1	-15 42.9	184 36.2	96 +15 00.9	-117				
13	330 53.4	60 19.7	27.0	316 12.2	19.5	216 52.5	04.2	101 57.4	42.9	199 04.8	97 14 49.2	-117				
14	345 55.8	75 19.3	27.2	331 13.0	20.2	231 55.2	04.2	116 59.8	42.9	213 33.5	97 14 37.5	-117				
15	0 58.3	90 18.9	27.3	346 13.9	20.9	246 58.0	04.3	132 02.1	42.9	228 02.2	98 14 25.8	-119				
16	16 00.8	105 18.5	27.5	1 14.7	21.6	262 00.8	04.3	147 04.5	43.0	242 31.0	100 14 13.9	-119				
17	31 03.2	120 18.1	27.6	16 15.5	22.3	277 03.5	04.4	162 06.9	43.0	257 00.0	100 14 02.0	-120				
18	46 05.7	135 17.7	-20 27.7	31 16.3	+ 6 23.1	292 06.3	+22 04.4	177 09.2	-15 43.0	271 29.0	100 +13 50.0	-120				
19	61 08.2	150 17.3	27.9	46 17.2	23.8	307 09.0	04.5	192 11.6	43.0	285 58.0	102 13 38.0	-121				
20	76 10.6	165 16.9	28.0	61 18.0	24.5	322 11.8	04.5	207 14.0	43.0	300 27.2	102 13 25.9	-122				
21	91 13.1	180 16.5	28.2	76 18.8	25.2	337 14.6	04.6	222 16.3	43.0	314 56.4	104 13 13.7	-122				
22	106 15.6	195 16.1	28.3	91 19.7	25.9	352 17.3	04.6	237 18.7	43.1	329 25.8	104 13 01.5	-123				
23	121 18.0	210 15.6	28.4	106 20.5	26.7	7 20.1	04.7	252 21.1	43.1	343 55.2	105 12 49.2	-123				
7	0	136 20.5	225 15.2	-20 28.6	121 21.3	+ 6 27.4	22 22.8	+22 04.7	267 23.4	-15 43.1	358 24.7	106 +12 36.9	-124			
1	151 22.9	240 14.8	28.7	136 22.2	28.1	37 25.6	04.8	282 25.8	43.1	12 54.3	106 12 24.5	-125				
2	166 25.4	255 14.4	28.8	151 23.0	28.8	52 28.3	04.8	297 28.2	43.1	27 23.9	107 12 12.0	-125				
3	181 27.9	270 14.0	29.0	166 23.8	29.5	67 31.1	04.9	312 30.5	43.1	41 53.6	108 11 59.5	-126				
4	196 30.3	285 13.6	29.1	181 24.6	30.2	82 33.9	04.9	327 32.9	43.2	56 23.4	109 11 46.9	-126				
5	211 32.8	300 13.2	29.2	196 25.5	31.0	97 36.6	05.0	342 35.3	43.2	70 53.3	110 11 34.3	-126				
6	226 35.3	315 12.7	-20 29.4	211 26.3	+ 6 31.7	112 39.4	+22 05.0	357 37.6	-15 43.2	85 23.3	110 +11 21.7	-128				
7	241 37.7	330 12.3	29.5	226 27.1	32.4	127 42.1	05.1	12 40.0	43.2	99 53.3	112 11 08.9	-127				
8	256 40.2	345 11.9	29.6	241 28.0	33.1	142 44.9	05.1	27 42.4	43.2	114 23.5	112 10 56.2	-128				
9	271 42.7	0 11.5	29.8	256 28.8	33.8	157 47.6	05.2	42 44.8	43.2	128 53.7	112 10 43.4	-129				
10	286 45.1	15 11.1	29.9	271 29.6	34.5	172 50.4	05.2	57 47.1	43.3	143 23.9	114 10 30.5	-129				
11	301 47.6	30 10.6	30.0	286 30.4	35.3	187 53.1	05.3	72 49.5	43.3	157 54.3	114 10 17.6	-129				
12	316 50.1	45 10.2	-20 30.1	301 31.3	+ 6 36.0	202 55.9	+22 05.3	87 51.9	-15 43.3	172 24.7	115 +10 04.7	-129				
13	331 52.5	60 09.8	30.3	316 32.1	36.7	217 58.7	05.4	102 54.2	43.3	186 55.2	115 9 51.8	-131				
14	346 55.0	75 09.4	30.4	331 32.9	37.4	233 01.4	05.4	117 56.6	43.3	201 25.7	117 9 38.7	-130				
15	1 57.4	90 09.0	30.5	346 33.8	38.1	248 04.2	05.4	132 59.0	43.3	215 56.4	117 9 25.7	-131				
16	16 59.9	105 08.5	30.6	1 34.6	38.8	263 06.9	05.5	148 01.3	43.3	230 27.1	117 9 12.6	-131				
17	32 02.4	120 08.1	30.7	16 35.4	39.5	278 09.7	05.5	163 03.7	43.4	244 57.8	119 8 59.5	-131				
18	47 04.8	135 07.7	-20 30.9	31 36.3	+ 6 40.3	293 12.4	+22 05.6	178 06.1	-15 43.4	259 28.7	119 + 8 46.4	-132				
19	62 07.3	150 07.3	31.0	46 37.1	41.0	308 15.2	05.6	193 08.4	43.4	273 59.6	120 8 33.2	-132				
20	77 09.8	165 06.8	31.1	61 37.9	41.7	323 17.9	05.7	208 10.8	43.4	288 30.6	120 8 20.0	-132				
21	92 12.2	180 06.4	31.2	76 38.7	42.4	338 20.7	05.7	223 13.2	43.4	303 01.6	121 8 06.8	-133				
22	107 14.7	195 06.0	31.3	91 39.6	43.1	353 23.4	05.8	238 15.6	43.4	317 32.7	122 7 53.5	-133				
23	122 17.2	210 05.6	31.5	106 40.4	43.8	8 26.2	05.8	253 17.9	43.5	332 03.9	122 7 40.2	-133				
8	0	137 19.6	225 05.1	-20 31.6	121 41.2	+ 6 44.5	23 28.9	+22 05.9	268 20.3	-15 43.5	346 35.1	123 + 7 26.9	-133			
1	152 22.1	240 04.7	31.7	136 42.1	45.3	38 31.7	05.9	283 22.7	43.5	1 06.4	124 7 13.6	-133				
2	167 24.5	255 04.3	31.8	151 42.9	46.0	53 34.4	06.0	298 25.0	43.5	15 37.8	124 7 00.3	-134				
3	182 27.0	270 03.9	31.9	166 43.7	46.7	68 37.2	06.0	313 27.4	43.5	30 09.2	125 6 46.9	-134				
4	197 29.5	285 03.4	32.0	181 44.5	47.4	83 39.9	06.1	328 29.8	43.5	44 40.7	125 6 33.5	-134				
5	212 31.9	300 03.0	32.1	196 45.4	48.1	98 42.7	06.1	343 32.2	43.5	59 12.2	126 6 20.1	-134				
6	227 34.4	315 02.6	-20 32.3	211 46.2	+ 6 48.8	113 45.4	+22 06.2	358 34.5	-15 43.6	73 43.8	127 + 6 06.7	-135				
7	242 36.9	330 02.1	32.4	226 47.0	49.5	128 48.2	06.2	13 36.9	43.6	88 15.5	127 5 53.2	-134				
8	257 39.3	345 01.7	32.5	241 47.9	50.3	143 50.9	06.2	28 39.3	43.6	102 47.2	128 5 39.8	-135				
9	272 41.8	0 01.3	32.6	256 48.7	51.0	158 53.7	06.3	43 41.6	43.6	117 19.0	128 5 26.3	-134				
10	287 44.3	15 00.9	32.7	271 49.5	51.7	173 56.4	06.3	58 44.0	43.6	131 50.8	129 5 12.9	-135				
11	302 46.7	30 00.4	32.8	286 50.3	52.4	188 59.2	06.4	73 46.4	43.6	146 22.7	129 4 59.4	-135				
12	317 49.2	45 00.0	-20 32.9	301 51.2	+ 6 53.1	204 01.9	+22 06.4	88 48.8	-15 43.7	160 54.6	130 + 4 45.9	-135				
13	332 51.7	59 59.6	33.0	316 52.0	53.8	219 04.7	06.5	103 51.1	43.7	175 26.6	130 4 32.4	-135				
14	347 54.1	74 59.1	33.1	331 52.8	54.5	234 07.4	06.5	118 53.5	43.7	189 58.6	131 4 18.9	-136				
15	2 56.6	89 58.7	33.2	346 53.7	55.2	249 10.2	06.6	133 55.9	43.7	204 30.7	131 4 05.3	-135				
16	17 59.0	104 58.2	33.3	1 54.5	56.0	264 12.9	06.6	148 58.3	43.7	219 02.8	132 3 51.8	-135				
17	33 01.5	119 57.8	33.4	16 55.3	56.7	279 15.7	06.7	164 00.6	43.7	233 35.0	132 3 38.3	-135				
18	48 04.0	134 57.4	-20 33.5	31 56.1	+ 6 5											

G M T	SUN			STARS			Lat.	Sunrise	Twilt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS						
	GHA	Dec.	No.	Name	SHA	Dec.				6	7	8	9	Alt.	Sun's Low r Limb	Venus	Mars			
h	°	'	°	°	'	°	N	h	m	h	m	h	m	h	m	°	'	'	'	
6	0	176 28.5	-15 55.1	7	Acamar	315 51.4	-40 29.2	72	9 48	5 35	14 17	16 44	18 51	20 50		Alt.	Sun's Low r Limb	Venus	Mars	
	1	191 28.5	54.3	5	Achernar	335 59.3	-57 28.0	70	9 17	5 36	14 49	16 59	18 55	20 46		Add	Add	Add	Add	
	2	206 28.4	53.6	30	Acruz	173 57.9	-62 51.0	68	8 55	5 38	15 13	17 10	18 59	20 43						
	3	221 28.4	52.8	19	Adhara	255 46.6	-28 54.8	66	8 37	5 39	15 31	17 20	19 02	20 40						
	4	236 28.3	52.1	10	Aldebaran	291 39.4	+16 25.3	64	8 23	5 39	15 45	17 28	19 05	20 38						
	5	251 28.3	51.3					62	8 11	5 39	15 57	17 34	19 07	20 36		0	0.6	0.2	0.1	
	6	266 28.2	-15 50.5	32	Alioth	166 58.5	+56 11.8	60	8 01	5 39	16 08	17 40	19 09	20 34		30	0.6	0.2	0.1	
	7	281 28.2	49.8	34	Alkaid	153 33.0	+49 31.8	58	7 52	5 38	16 16	17 45	19 11	20 33		45	0.6	0.1	0.1	
	8	296 28.1	49.0	55	Al Na'ir	28 38.9	-47 10.8	56	7 44	5 39	16 24	17 50	19 12	20 32		60	0.6	0.1	0.0	
	9	311 28.1	48.2	15	Alnilam	276 30.5	-1 13.8	54	7 38	5 38	16 31	17 54	19 13	20 30		75	0.6	0.0	0.0	
	10	326 28.0	47.5	25	Alphard	218 38.7	-8 28.0	52	7 31	5 37	16 37	17 57	19 15	20 29		90				
	11	341 28.0	46.7					50	7 26	5 36	16 43	18 01	19 16	20 28						
	12	356 28.0	-15 46.0	41	Alphecca	126 48.0	+26 51.6	45	7 13	5 35	16 55	18 08	19 18	20 26		Moon's Lower Limb				
	13	11 27.9	45.2	1	Alpheratz	358 29.1	+28 50.7	40	7 03	5 32	17 05	18 14	19 20	20 24		Add				
	14	26 27.9	44.4	51	Altair	62 51.2	+8 44.8	35	6 55	5 30	17 13	18 19	19 22	20 23		Alt.	6	7	8	
	15	41 27.8	43.7	2	Ankaa	353 59.0	-42 33.1	30	6 47	5 27	17 20	18 23	19 24	20 22		°	'	'	'	
	16	56 27.8	42.9	42	Antares	113 20.0	-26 20.1	20	6 34	5 19	17 33	18 31	19 26	20 20		0	17.5	16.7	15.9	
	17	71 27.7	42.1					10	6 22	5 10	17 44	18 38	19 29	20 18		4	17.5	16.7	15.9	
	18	86 27.7	-15 41.4	37	Arcturus	146 35.5	+19 24.6	0	6 11	5 00	17 54	18 44	19 31	20 16		8	17.4	16.7	15.9	
	19	101 27.7	40.6	43	Atria	109 01.4	-68 56.7	10	5 59	4 46	18 05	18 50	19 33	20 14		12	17.4	16.7	15.9	
	20	116 27.6	39.8	22	Avior	234 35.4	-59 22.0	20	5 47	4 29	18 16	18 57	19 36	20 12		16	17.4	16.7	15.9	
	21	131 27.6	39.1	13	Bellatrix	279 18.7	+6 18.6	30	5 33	4 05	18 28	19 05	19 38	20 10		20	17.4	16.6	15.9	
	22	146 27.5	38.3	16	Betelge'se	271 48.4	+7 24.0	35	5 25	3 50	18 35	19 09	19 40	20 09		24	17.3	16.6	15.9	
	23	161 27.5	37.5					40	5 15	3 30	18 44	19 14	19 42	20 07		28	17.3	16.6	15.9	
				17	Canopus	264 15.2	-52 40.4	45	5 04	3 04	18 53	19 20	19 44	20 06		32	17.2	16.5	15.9	
				12	Capella	281 38.8	+45 57.4	50	4 51	2 27	19 04	19 27	19 46	20 04		36	17.1	16.5	15.9	
				53	Deneb	50 01.8	+45 07.1	52	4 45	2 07	19 10	19 30	19 47	20 03		40	17.1	16.5	15.9	
				28	Denebola	183 17.9	+14 49.1	54	4 37	1 39	19 15	19 33	19 48	20 02		44	17.0	16.4	15.8	
				4	Diphda	349 39.9	-18 14.0	56	4 30	0 48	19 22	19 37	19 50	20 01		48	16.9	16.4	15.8	
								58	4 21	///	19 29	19 41	19 51	20 00		52	16.8	16.3	15.8	
				27	Dubhe	194 44.4	+61 59.3	60	4 11	///	19 37	19 46	19 53	19 59		56	16.8	16.3	15.8	
				14	Elnath	279 07.7	+28 34.4	S								60	16.7	16.2	15.8	
				47	Eltanin	91 06.8	+51 29.3									64	16.6	16.2	15.8	
				54	Enif	34 30.4	+9 40.1									68	16.5	16.1	15.7	
				56	Fomalhaut	16 12.4	-29 51.7									72	16.4	16.0	15.7	
								N	°	h	m	h	m	h	m	h	m	h	m	
				31	Gacrux	172 49.4	-56 51.7	72	14 42	18 59	9 27	8 45	8 18	7 55		76	16.3	16.0	15.7	
				29	Gienah	176 37.1	-17 17.7	70	15 13	18 57	8 53	8 28	8 10	7 55		80	16.2	15.9	15.7	
				35	Hadar	149 49.9	-60 09.3	68	15 35	18 55	8 28	8 15	8 04	7 55		84	16.1	15.9	15.7	
				6	Hamal	328 50.2	+23 15.2	66	15 52	18 54	8 09	8 04	7 59	7 54		88	16.0	15.8	15.6	
				48	Kaus Aust.	84 42.1	-34 24.4	64	16 06	18 53	7 53	7 54	7 54	7 54		Add to table, back cover				
				62				62	16 18	18 52	7 40	7 46	7 51	7 54		Moon's Upper Limb				
				60	Kochab	137 17.7	+74 19.9	60	16 28	18 52	7 29	7 39	7 47	7 54		Subtract				
				57	Markab	14 22.2	+14 57.9	58	16 37	18 52	7 19	7 33	7 44	7 54		Alt.	6	7	8	
				8	Menkar	315 00.8	+3 54.9	56	16 45	18 53	7 10	7 28	7 42	7 54		°	'	'	'	
				36	Menkent	148 59.1	-36 09.0	54	16 52	18 53	7 03	7 23	7 39	7 54		0	14.5	14.9	15.3	
				24	Miapl'dus	221 48.3	-69 32.0	52	16 58	18 53	6 56	7 18	7 37	7 54		4	14.5	14.9	15.3	
								50	17 03	18 53	6 50	7 14	7 35	7 54		8	14.5	14.9	15.3	
				9	Mirfak	309 43.0	+49 42.5	45	17 16	18 56	6 36	7 05	7 30	7 53		12	14.5	14.9	15.3	
				50	Nunki	76 52.7	-26 21.3	40	17 26	18 58	6 25	6 58	7 27	7 53		16	14.5	14.9	15.3	
				52	Peacock	54 28.5	-56 52.8	35	17 34	19 00	6 15	6 51	7 23	7 53		20	14.5	14.9	15.3	
				21	Pollux	244 20.8	+28 08.1	30	17 42	19 03	6 07	6 46	7 21	7 53		24	14.6	15.0	15.4	
				20	Procyon	245 45.1	+5 20.4	20	17 55	19 10	5 52	6 36	7 15	7 53		28	14.7	15.0	15.4	
								10	18 07	19 19	5 39	6 27	7 11	7 53		32	14.7	15.0	15.4	
				46	R'alhague	96 47.2	+12 35.3	0	18 18	19 29	5 27	6 18	7 07	7 53		36	14.8	15.1	15.4	
				26	Regulus	208 29.6	+12 11.0	10	18 29	19 42	5 15	6 10	7 02	7 52		40	14.8	15.1	15.4	
				11	Rigel	281 53.9	-8 15.2	20	18 41	19 59	5 02	6 01	6 58	7 52		44	14.9	15.2	15.4	
				38	Rigel Kent.	140 51.5	-60 39.0	30	18 55	20 22	4 46	5 51	6 52	7 52		48	15.0	15.2	15.4	
				44	Sabik	103 02.9	-15 40.3	35	19 03	20 37	4 38	5 45	6 49	7 52		52	15.1	15.3	15.5	
								40	19 12	20 56	4 27	5 38	6 46	7 51		56	15.2	15.3	15.5	
				3	Schedar	350 30.9	+56 17.8	45	19 23	21 21	4 15	5 30	6 42	7 51		60	15.3	15.4	15.5	
				45	Shaula	97 21.5	-37 04.3	50	19 36	21 56	4 01	5 20	6 37	7 51		64	15.3	15.4	15.5	
				18	Sirius	259 12.0	-16 39.3	52	19 43	22 17	3 54	5 15	6 35	7 51		68	15.4	15.5	15.5	
				23	Spica	159 17.2	-10 55.8	54	19 49	22 43	3 46	5 11	6 32	7 50		72	15.5	15.5	15.5	
				33	Suhail	223 24.2	-43 15.2	56	19 57	23 28	3 38	5 05	6 29	7 50		76	15.6	15.6	15.6	
								58	20 06	///	3 28	4 59	6 26	7 50		80	15.8	15.7	15.6	
				49	Vega	81 08.9	+38 44.3	60	20 16	///	3 17	4 52	6 23	7 50		84	15.9	15.7	15.6	
				39	Zub'g'bi	137 53.8	-15 51.5	S								88	15.9	15.8	15.6	
								G	Equation of Time (App.—Mean)				GMT of Transit							
								M	Meridian of Greenwich											
								T	6	7	8	DAY	Moon	Venus	Mars	Jupiter	Saturn			
								h	m	s	'	m	s	h	m	h	m	h	m	
								0	-14	05.8	-14	10.1	-14	13.6	6	24	07	8 59	15 55	
								6	-14	07.0	-14	11.1	-14	14.3	7	07	8 59	15 54		
								12	-14	08.1	-14	12.0	-14	15.0	8	05	9 00	15 52		
								18	-14	09.1	-14	12.8	-14	15.7	9	14	9 01	15 51		
								24	-14	10.1	-14	13.6	-14	16.3						

G M T	T	VENUS -3.9			MARS 1.3			JUPITER -2.1			SATURN 0.7			MOON			
		GHA	GHA	Dec.	GHA	GHA	Dec.	GHA	GHA	Dec.	GHA	GHA	Dec.	GHA	code	Dec.	code
h	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
9	0	138 18.8	224 54.7	-20 34.1	122 01.1	+ 7 01.7		24 34.9	+22 07.0		269 17.3	-15 43.8		335 21.5	136 +	2 03.7	-135
	1	153 21.2	239 54.3	34.2	137 01.9	02.4		39 37.7	07.0		284 19.6	43.8		349 54.1	136	1 50.2	-135
	2	168 23.7	254 53.9	34.3	152 02.8	03.1		54 40.4	07.1		299 22.0	43.9		4 26.7	136	1 36.7	-135
	3	183 26.1	269 53.4	34.4	167 03.6	03.8		69 43.1	07.1		314 24.4	43.9		18 59.3	136	1 23.2	-135
	4	198 28.6	284 53.0	34.5	182 04.4	04.5		84 45.9	07.2		329 26.8	43.9		33 31.9	137	1 09.7	-135
	5	213 31.1	299 52.5	34.6	197 05.2	05.2		99 48.6	07.2		344 29.1	43.9		48 04.6	137	0 56.2	-135
	6	228 33.5	314 52.1	-20 34.7	212 06.1	+ 7 05.9		114 51.4	+22 07.3		359 31.5	-15 43.9		62 37.3	138 +	0 42.7	-134
	7	243 36.0	329 51.7	34.8	227 06.9	06.6		129 54.1	07.3		14 33.9	43.9		77 10.1	138	0 29.3	-135
	8	258 38.5	344 51.2	34.9	242 07.7	07.3		144 56.9	07.4		29 36.3	43.9		91 42.9	138	0 15.8	-134
	9	273 40.9	359 50.8	35.0	257 08.6	08.1		159 59.6	07.4		44 38.6	44.0		106 15.7	139 +	0 02.4	-134
	10	288 43.4	14 50.3	35.0	272 09.4	08.8		175 02.4	07.4		59 41.0	44.0		120 48.6	139 -	0 11.0	-134
	11	303 45.9	29 49.9	35.1	287 10.2	09.5		190 05.1	07.5		74 43.4	44.0		135 21.5	139	0 24.4	-134
	12	318 48.3	44 49.4	-20 35.2	302 11.0	+ 7 10.2		205 07.8	+22 07.5		89 45.8	-15 44.0		149 54.4	140 -	0 37.8	-133
	13	333 50.8	59 49.0	35.3	317 11.9	10.9		220 10.6	07.6		104 48.2	44.0		164 27.4	139	0 51.1	-134
	14	348 53.3	74 48.5	35.4	332 12.7	11.6		235 13.3	07.6		119 50.5	44.0		179 00.3	140	1 04.5	-133
	15	3 55.7	89 48.1	35.5	347 13.5	12.3		250 16.1	07.7		134 52.9	44.0		193 33.3	141	1 17.8	-133
	16	18 58.2	104 47.6	35.6	2 14.3	13.0		265 18.8	07.7		149 55.3	44.0		208 06.4	140	1 31.1	-133
	17	34 00.6	119 47.2	35.6	17 15.2	13.7		280 21.6	07.8		164 57.7	44.1		222 39.4	141	1 44.4	-132
	18	49 03.1	134 46.8	-20 35.7	32 16.0	+ 7 14.4		295 24.3	+22 07.8		180 00.0	-15 44.1		237 12.5	142 -	1 57.6	-133
	19	64 05.6	149 46.3	35.8	47 16.8	15.1		310 27.0	07.8		195 02.4	44.1		251 45.7	141	2 10.9	-132
	20	79 08.0	164 45.9	35.9	62 17.7	15.9		325 29.8	07.9		210 04.8	44.1		266 18.8	142	2 24.1	-131
	21	94 10.5	179 45.4	36.0	77 18.5	16.6		340 32.5	07.9		225 07.2	44.1		280 52.0	141	2 37.2	-132
	22	109 13.0	194 45.0	36.0	92 19.3	17.3		355 35.3	08.0		240 09.6	44.1		295 25.1	142	2 50.4	-131
	23	124 15.4	209 44.5	36.1	107 20.1	18.0		10 38.0	08.0		255 11.9	44.1		309 58.3	143	3 03.5	-131
	10	0	139 17.9	224 44.1	-20 36.2	122 21.0	+ 7 18.7		25 40.7	+22 08.1		270 14.3	-15 44.2		324 31.6	142 -	3 16.6
1		154 20.4	239 43.6	36.3	137 21.8	19.4		40 43.5	08.1		285 16.7	44.2		339 04.8	143	3 29.7	-131
2		169 22.8	254 43.1	36.3	152 22.6	20.1		55 46.2	08.2		300 19.1	44.2		353 38.1	142	3 42.8	-130
3		184 25.3	269 42.7	36.4	167 23.4	20.8		70 49.0	08.2		315 21.5	44.2		8 11.3	143	3 55.8	-130
4		199 27.8	284 42.2	36.5	182 24.3	21.5		85 51.7	08.3		330 23.8	44.2		22 44.6	143	4 08.8	-129
5		214 30.2	299 41.8	36.6	197 25.1	22.2		100 54.4	08.3		345 26.2	44.2		37 17.9	144	4 21.7	-129
6		229 32.7	314 41.3	-20 36.6	212 25.9	+ 7 22.9		115 57.2	+22 08.3		0 28.6	-15 44.2		51 51.3	143 -	4 34.6	-129
7		244 35.1	329 40.9	36.7	227 26.7	23.6		130 59.9	08.4		15 31.0	44.2		66 24.6	143	4 47.5	-129
8		259 37.6	344 40.4	36.8	242 27.6	24.4		146 02.6	08.4		30 33.4	44.3		80 57.9	144	5 00.4	-128
9		274 40.1	359 40.0	36.8	257 28.4	25.1		161 05.4	08.5		45 35.7	44.3		95 31.3	144	5 13.2	-127
10		289 42.5	14 39.5	36.9	272 29.2	25.8		176 08.1	08.5		60 38.1	44.3		110 04.7	144	5 25.9	-128
11		304 45.0	29 39.0	37.0	287 30.0	26.5		191 10.9	08.6		75 40.5	44.3		124 38.1	144	5 38.7	-127
12		319 47.5	44 38.6	-20 37.0	302 30.9	+ 7 27.2		206 13.6	+22 08.6		90 42.9	-15 44.3		139 11.5	144 -	5 51.4	-127
13		334 49.9	59 38.1	37.1	317 31.7	27.9		221 16.3	08.6		105 45.3	44.3		153 44.9	144	6 04.1	-126
14		349 52.4	74 37.7	37.2	332 32.5	28.6		236 19.1	08.7		120 47.6	44.3		168 18.3	144	6 16.7	-126
15		4 54.9	89 37.2	37.2	347 33.4	29.3		251 21.8	08.7		135 50.0	44.3		182 51.7	144	6 29.3	-125
16		19 57.3	104 36.8	37.3	2 34.2	30.0		266 24.5	08.8		150 52.4	44.4		197 25.1	144	6 41.8	-125
17		34 59.8	119 36.3	37.4	17 35.0	30.7		281 27.3	08.8		165 54.8	44.4		211 58.5	144	6 54.3	-125
18		50 02.2	134 35.8	-20 37.4	32 35.8	+ 7 31.4		296 30.0	+22 08.9		180 57.2	-15 44.4		226 31.9	145 -	7 06.8	-124
19		65 04.7	149 35.4	37.5	47 36.7	32.1		311 32.8	08.9		195 59.5	44.4		241 05.4	144	7 19.2	-124
20		80 07.2	164 34.9	37.5	62 37.5	32.8		326 35.5	09.0		211 01.9	44.4		255 38.8	145	7 31.6	-123
21		95 09.6	179 34.5	37.6	77 38.3	33.5		341 38.2	09.0		226 04.3	44.4		270 12.3	144	7 43.9	-123
22		110 12.1	194 34.0	37.7	92 39.1	34.2		356 41.0	09.0		241 06.7	44.4		284 45.7	144	7 56.2	-122
23		125 14.6	209 33.5	37.7	107 40.0	34.9		11 43.7	09.1		256 09.1	44.4		299 19.1	145	8 08.4	-122
11	0	140 17.0	224 33.1	-20 37.8	122 40.8	+ 7 35.7		26 46.4	+22 09.1		271 11.5	-15 44.5		313 52.6	144 -	8 20.6	-122
	1	155 19.5	239 32.6	37.8	137 41.6	36.4		41 49.2	09.2		286 13.8	44.5		328 26.0	144	8 32.8	-120
	2	170 22.0	254 32.1	37.9	152 42.4	37.1		56 51.9	09.2		301 16.2	44.5		342 59.4	145	8 44.8	-121
	3	185 24.4	269 31.7	37.9	167 43.3	37.8		71 54.6	09.3		316 18.6	44.5		357 32.9	144	8 56.9	-120
	4	200 26.9	284 31.2	38.0	182 44.1	38.5		86 57.4	09.3		331 21.0	44.5		12 06.3	144	9 08.9	-119
	5	215 29.4	299 30.7	38.0	197 44.9	39.2		102 00.1	09.3		346 23.4	44.5		26 39.7	145	9 20.8	-119
	6	230 31.8	314 30.3	-20 38.1	212 45.7	+ 7 39.9		117 02.8	+22 09.4		1 25.8	-15 44.5		41 13.2	144 -	9 32.7	-119
	7	245 34.3	329 29.8	38.1	227 46.6	40.6		132 05.6	09.4		16 28.2	44.5		55 46.6	144	9 44.6	-118
	8	260 36.7	344 29.3	38.2	242 47.4	41.3		147 08.3	09.5		31 30.5	44.5		70 20.0	144	9 56.4	-117
	9	275 39.2	359 28.9	38.2	257 48.2	42.0		162 11.0	09.5		46 32.9	44.6		84 53.4	144	10 08.1	-117
	10	290 41.7	14 28.4	38.3	272 49.0	42.7		177 13.8	09.6		61 35.3	44.6		99 26.8	143	10 19.8	-116
	11	305 44.1	29 27.9	38.3	287 49.9	43.4		192 16.5	09.6		76 37.7	44.6		114 00.1	144	10 31.4	-116
	12	320 46.6	44 27.5	-20 38.4	302 50.7	+ 7 44.1		207 19.2	+22 09.6		91 40.1	-15 44.6		128 33.5	144	10 43.0	-115
	13	335 49.1	59 27.0	38.4	317 51.5	44.8		222 22.0	09.7		106 42.5	44.6		143 06.9	143	10 54.5	-115
	14	350 51.5	74 26.5	38.5	332 52.3	45.5		237 24.7	09.7		121 44.8	44.6		157 40.2	144	11 06.0	-114
	15	5 54.0	89 26.1	38.5	347 53.2	46.2		252 27.4	09.8		136 47.2	44.6		172 13.6			

G M T	SUN			STARS			Lat.	Sunrise	Twilt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS						
	GHA	Dec.	No.	Name	SHA	Dec.								Alt.	Sun's Low'r Limb	Venus	Mars			
										9	10	11	12					Add	Add	Add
h	°	'	°	'	°	'	N	h	m	h	m	h	m	h	m	°	'	°	'	
9	0	176 25.9	-14 59.2	7	Acamar	315 51.4	-40 29.2	72	9 28	5 24	20 50	22 48	24 54	0 54		Alt.				
	1	191 25.9	58.5	5	Achernar	335 59.4	-57 28.0	70	9 02	5 27	20 46	22 35	24 28	0 28						
	2	206 25.9	57.7	30	Acrux	173 57.9	-62 51.0	68	8 42	5 28	20 43	22 25	24 08	0 08						
	3	221 25.9	56.9	19	Adhara	255 46.6	-28 54.8	66	8 26	5 30	20 40	22 16	23 52	25 31						
	4	236 25.8	56.1	10	Aldebaran	291 39.4	+16 25.3	64	8 14	5 32	20 38	22 09	23 40	25 11		0	0.5	0.2	0.1	
	5	251 25.8	55.3					62	8 03	5 33	20 36	22 03	23 29	24 55		30	0.5	0.1	0.1	
	6	266 25.8	-14 54.5	32	Alioth	166 58.5	+56 11.8	60	7 53	5 33	20 34	21 58	23 20	24 41		45	0.5	0.1	0.1	
	7	281 25.8	53.7	34	Alkaid	153 33.0	+49 31.8	58	7 45	5 33	20 33	21 53	23 12	24 30		60	0.5	0.1	0.1	
	8	296 25.7	52.9	55	Al Na'ir	28 38.9	-47 10.8	56	7 38	5 33	20 32	21 49	23 05	24 20		75	0.5	0.1	0.0	
	9	311 25.7	52.1	15	Alnilam	276 30.5	-1 13.8	54	7 32	5 33	20 30	21 45	22 59	24 11		90	0.5	0.0	0.0	
10	0	326 25.7	51.3	25	Alphard	218 38.7	-8 28.0	52	7 26	5 33	20 29	21 42	22 53	24 03						
	11	341 25.7	50.5					50	7 21	5 32	20 28	21 39	22 48	23 56						
	12	356 25.7	-14 49.7	41	Alphecca	126 48.0	+26 51.6	45	7 09	5 31	20 26	21 32	22 37	23 41						
	13	11 25.6	48.9	1	Alpheratz	358 29.1	+28 50.7	40	7 00	5 29	20 24	21 27	22 29	23 29						
	14	26 25.6	48.1	51	Altair	62 51.2	+8 44.8	35	6 52	5 27	20 23	21 22	22 21	23 19		Alt.	9	10	11	
	15	41 25.6	47.3	2	Ankaa	353 59.0	-42 33.1	30	6 45	5 25	20 22	21 18	22 14	23 10		°	'	'	'	
	16	56 25.6	46.5	42	Antares	113 20.0	-26 20.1	20	6 32	5 18	20 20	21 11	22 03	22 54		0	15.0	14.2	13.4	
	17	71 25.6	45.7					10	6 21	5 09	20 18	21 05	21 53	22 41		4	15.0	14.2	13.4	
	18	86 25.6	-14 44.9	37	Arcturus	146 35.5	+19 24.6	0	6 11	5 00	20 16	21 00	21 44	22 28		8	15.0	14.2	13.4	
	19	101 25.5	44.1	43	Atria	109 01.4	-68 56.7	10	6 00	4 47	20 14	20 54	21 34	22 16		12	15.1	14.2	13.4	
	20	116 25.5	43.3	22	Avior	234 35.4	-59 22.0	20	5 49	4 30	20 12	20 48	21 24	22 02		16	15.1	14.2	13.5	
	21	131 25.5	42.5	13	Bellatrix	279 18.7	+6 18.6	30	5 36	4 09	20 10	20 41	21 13	21 47		20	15.1	14.2	13.5	
	22	146 25.5	41.7	16	Betelgeuse	271 48.4	+7 24.0	35	5 28	3 54	20 09	20 38	21 07	21 38		24	15.1	14.3	13.6	
	23	161 25.5	40.9					40	5 19	3 35	20 07	20 33	21 00	21 29		28	15.1	14.3	13.6	
				17	Canopus	264 15.2	-52 40.5	45	5 09	3 12	20 06	20 28	20 51	21 17		32	15.1	14.3	13.7	
10	0	176 25.5	-14 40.1	12	Capella	281 38.8	+45 57.4	50	4 56	2 38	20 04	20 22	20 41	21 03		36	15.1	14.3	13.7	
	1	191 25.4	39.3	53	Deneb	50 01.8	+45 07.1	52	4 51	2 19	20 03	20 19	20 37	20 57		40	15.1	14.4	13.8	
	2	206 25.4	38.5	28	Denebola	183 17.9	+14 49.1	54	4 44	1 54	20 02	20 16	20 32	20 49		44	15.2	14.5	13.9	
	3	221 25.4	37.7	4	Diphda	349 39.9	-18 14.0	56	4 37	1 19	20 01	20 13	20 26	20 41		48	15.2	14.5	14.0	
	4	236 25.4	36.9					58	4 29	///	20 00	20 10	20 20	20 32		52	15.2	14.6	14.1	
	5	251 25.4	36.1	27	Dubhe	194 44.4	+61 59.3	60	4 19	///	19 59	20 05	20 13	20 22		56	15.2	14.7	14.2	
	6	266 25.4	-14 35.3	14	Elnath	279 07.7	+28 34.4	S								60	15.3	14.7	14.3	
	7	281 25.4	34.5	47	Eltanin	91 06.8	+51 29.3		Lat.	Sunset	Twilt. ends	Moonset					64	15.3	14.8	14.4
	8	296 25.3	33.7	54	Enif	34 30.4	+9 40.1					9	10	11	12		68	15.3	14.9	14.5
	9	311 25.3	32.9	56	Fomalhaut	16 12.4	-29 51.7	N									72	15.3	14.9	14.6
	10	326 25.3	32.1					°	h	m	h	m	h	m	h	m	76	15.4	15.0	14.7
	11	341 25.3	31.3	31	Gacrux	172 49.4	-56 51.7	72	15 02	19 10	7 55	7 33	7 08	6 34		80	15.4	15.1	14.9	
	12	356 25.3	-14 30.5	29	Gienah	176 37.1	-17 17.7	70	15 28	19 07	7 55	7 39	7 23	7 02		84	15.4	15.2	15.0	
	13	11 25.3	29.6	35	Hadar	149 49.9	-60 09.3	68	15 48	19 05	7 55	7 45	7 35	7 23		88	15.4	15.2	15.0	
	14	26 25.3	28.8	6	Hamal	328 50.2	+23 15.2	66	16 03	19 02	7 54	7 50	7 45	7 40		90				
	15	41 25.3	28.0	48	Kaus Aust.	84 42.0	-34 24.4	64	16 16	19 01	7 54	7 54	7 53	7 54			Add to table, back cover			
	16	56 25.3	27.2					62	16 27	19 00	7 54	7 57	8 01	8 05						
	17	71 25.2	26.4	40	Kochab	137 17.7	+74 19.9	60	16 36	18 59	7 54	8 00	8 07	8 15						
	18	86 25.2	-14 25.6	57	Markab	14 22.2	+14 57.9	58	16 44	18 58	7 54	8 03	8 13	8 24			Moon's Upper Limb Subtract			
	19	101 25.2	24.8	8	Menkar	315 00.8	+3 54.9	56	16 51	18 58	7 54	8 06	8 18	8 32		Alt.	9	10	11	
	20	116 25.2	24.0	36	Menkent	148 59.1	-36 09.0	54	16 58	18 58	7 54	8 08	8 22	8 39		°	'	'	'	
	21	131 25.2	23.2	24	Miapl'dus	221 48.3	-69 32.0	52	17 03	18 58	7 54	8 10	8 26	8 45		4	15.8	16.4	16.8	
	22	146 25.2	22.4					50	17 09	18 59	7 54	8 12	8 30	8 51		8	15.8	16.3	16.8	
	23	161 25.2	21.5	9	Mirfak	309 43.0	+49 42.5	45	17 20	18 59	7 53	8 16	8 38	9 03		12	15.8	16.3	16.8	
				50	Nunki	76 52.7	-26 21.3	40	17 29	19 01	7 53	8 19	8 45	9 13		16	15.8	16.3	16.7	
11	0	176 25.2	-14 20.7	52	Peacock	54 28.5	-56 52.8	35	17 37	19 03	7 53	8 22	8 51	9 21		20	15.8	16.3	16.7	
	1	191 25.2	19.9	21	Pollux	244 20.8	+28 08.1	30	17 44	19 05	7 53	8 25	8 56	9 29		24	15.8	16.3	16.7	
	2	206 25.2	19.1	20	Procyon	245 45.1	+5 20.3	20	17 57	19 12	7 53	8 29	9 05	9 42		28	15.8	16.2	16.6	
	3	221 25.2	18.3					10	18 07	19 19	7 53	8 33	9 13	9 54		32	15.8	16.2	16.6	
	4	236 25.2	17.5	46	R'alhague	96 47.2	+12 35.3	0	18 18	19 29	7 53	8 37	9 21	10 05		36	15.8	16.2	16.6	
	5	251 25.2	16.7	26	Regulus	208 29.6	+12 11.0	10	18 28	19 41	7 52	8 41	9 28	10 16		40	15.8	16.2	16.5	
	6	266 25.1	-14 15.8	11	Rigel	281 53.9	-8 15.2	20	18 39	19 57	7 52	8 45	9 36	10 28		44	15.8	16.1	16.4	
	7	281 25.1	15.0	38	Rigil Kent.	140 51.5	-60 39.0	30	18 52	20 18	7 52	8 49	9 45	10 41		48	15.7	16.1	16.4	
	8	296 25.1	14.2	44	Sabik	103 02.8	-15 40.3	35	19 00	20 33	7 52	8 52	9 51	10 49		52	15.7	16.0	16.3	
	9	311 25.1	13.4					40	19 09	20 51	7 51	8 55	9 57	10 58		56	15.7	16.0	16.2	
	10	326 25.1	12.6	3	Schedar	350 30.9	+56 17.8	45	19 19	21 15	7 51	8 58	10 04	11 08		60	15.7	15.9	16.1	
	11	341 25.1	11.8	45	Shaula	97 21.5	-37 04.3	50	19 31	21 47	7 51	9 02	10 12	11 21		64	15.7	15.8	16.0	
	12	356 25.1	-14 10.9	18	Sirius	259 12.0	-16 39.4	52	19 37	22 05	7 51	9 04	10 16	11 27		68	15.6	15.8	15.9	
	13	11 25.1	10.1	33	Spica	159 17.2	-10 55.8	54	19 43	22 28	7 50	9 06	10 21	11 34		72	15.6	15.7	15.8	
	14	26 25.1	09.3	23	Suhail	223 24.2	-43 15.2	56	19 50	23 01	7 50	9 09	10 25	11 41		76	15.6	15.6	15.7	
	15	41 25.1	08.5					58	19 58	///	7 50	9 11	10 31	11 49		80	15.6	15.6	15.6	
	16	56 25.1	07.7	49	Vega	81 08.9	+38 44.2	60	20 08	///	7 50	9 14	10 37	11 59		84	15.5	15.5	15.4	
	17	71 25.1	06.9	39	Zub'g'bi	137 53.8	-15 51.5	S								88	15.5	15.4	15.3	
	18	86 25.1	-14 06.0													90	15.4	15.3	15.1	
	19	101 25.1	05.2																	
	20	116 25.1	04.4																	
	21	131 25.1	03.6																	
	22	146 25.1	02.8																	
	23	161 25.1	01.9																	
	24	176 25.1	-14 01																	

G M T	T		VENUS - 3.9		MARS 1.3		JUPITER - 2.1		SATURN 0.7		MOON			
	GHA		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
12	h	o	o	o	o	o	o	o	o	o	o	o	o	o
	o	o	o	o	o	o	o	o	o	o	o	o	o	o
	0	141 16.2	224 21.8	-20 38.9	123 00.6	+ 7 52.5	27 52.0	+22 10.2	272 08.7	-15 44.7	303 13.0	142	-12 57.3	-108
	1	156 18.6	239 21.3	38.9	138 01.4	53.2	42 54.7	10.2	287 11.1	44.7	317 46.2	141	13 08.1	-108
	2	171 21.1	254 20.9	38.9	153 02.2	53.9	57 57.4	10.2	302 13.5	44.7	332 19.3	142	13 18.9	-106
	3	186 23.6	269 20.4	.. 39.0	168 03.1	.. 54.6	73 00.2	.. 10.3	317 15.9	.. 44.8	346 52.5	141	13 29.5	-106
	4	201 26.0	284 19.9	39.0	183 03.9	55.3	88 02.9	10.3	332 18.3	44.8	1 25.6	141	13 40.1	-106
	5	216 28.5	299 19.4	39.0	198 04.7	56.0	103 05.6	10.4	347 20.7	44.8	15 58.7	141	13 50.7	-105
	6	231 31.0	314 19.0	-20 39.1	213 05.5	+ 7 56.7	118 08.3	+22 10.4	2 23.0	-15 44.8	30 31.8	141	-14 01.2	-104
	7	246 33.4	329 18.5	39.1	228 06.3	57.4	133 11.1	10.5	17 25.4	44.8	45 04.9	140	14 11.6	-103
	8	261 35.9	344 18.0	39.1	243 07.2	58.1	148 13.8	10.5	32 27.8	44.8	59 37.9	140	14 21.9	-103
	9	276 38.3	359 17.5	.. 39.2	258 08.0	.. 58.8	163 16.5	.. 10.5	47 30.2	.. 44.8	74 10.9	140	-14 32.2	-102
	10	291 40.8	14 17.1	39.2	273 08.8	7 59.5	178 19.2	10.6	62 32.6	44.8	88 43.9	140	14 42.4	-101
	11	306 43.3	29 16.6	39.2	288 09.6	8 00.2	193 22.0	10.6	77 35.0	44.8	103 16.9	139	14 52.5	-100
	12	321 45.7	44 16.1	-20 39.2	303 10.5	+ 8 00.9	208 24.7	+22 10.7	92 37.4	-15 44.9	117 49.8	139	-15 02.5	-100
	13	336 48.2	59 15.6	39.3	318 11.3	01.6	223 27.4	10.7	107 39.8	44.9	132 22.7	139	15 12.5	-100
	14	351 50.7	74 15.1	39.3	333 12.1	02.3	238 30.1	10.7	122 42.2	44.9	146 55.6	139	15 22.5	-98
	15	6 53.1	89 14.7	.. 39.3	348 12.9	.. 03.0	253 32.9	.. 10.8	137 44.5	.. 44.9	161 28.5	138	-15 32.3	-98
	16	21 55.6	104 14.2	39.3	3 13.8	03.7	268 35.6	10.8	152 46.9	44.9	176 01.3	138	15 42.1	-97
	17	36 58.1	119 13.7	39.3	18 14.6	04.4	283 38.3	10.9	167 49.3	44.9	190 34.1	138	15 51.8	-96
	18	52 00.5	134 13.2	-20 39.4	33 15.4	+ 8 05.1	298 41.0	+22 10.9	182 51.7	-15 44.9	205 06.9	138	-16 01.4	-95
	19	67 03.0	149 12.7	39.4	48 16.2	05.8	313 43.8	11.0	197 54.1	44.9	219 39.7	137	16 10.9	-95
	20	82 05.5	164 12.2	39.4	63 17.0	06.5	328 46.5	11.0	212 56.5	44.9	234 12.4	137	16 20.4	-94
	21	97 07.9	179 11.8	.. 39.4	78 17.9	.. 07.2	343 49.2	.. 11.0	227 58.9	.. 44.9	248 45.1	136	-16 29.8	-93
22	112 10.4	194 11.3	39.4	93 18.7	07.9	358 51.9	11.1	243 01.3	45.0	263 17.7	137	16 39.1	-93	
23	127 12.8	209 10.8	39.5	108 19.5	08.6	13 54.6	11.1	258 03.7	45.0	277 50.4	136	16 48.4	-92	
13	0	142 15.3	224 10.3	-20 39.5	123 20.3	+ 8 09.3	28 57.4	+22 11.2	273 06.1	-15 45.0	292 23.0	136	-16 57.6	-90
	1	157 17.8	239 09.8	39.5	138 21.2	10.0	44 00.1	11.2	288 08.5	45.0	306 55.6	135	17 06.6	-91
	2	172 20.2	254 09.3	39.5	153 22.0	10.7	59 02.8	11.2	303 10.9	45.0	321 28.1	135	17 15.7	-89
	3	187 22.7	269 08.9	.. 39.5	168 22.8	.. 11.4	74 05.5	.. 11.3	318 13.2	.. 45.0	336 00.6	135	-17 24.6	-88
	4	202 25.2	284 08.4	39.5	183 23.6	12.1	89 08.2	11.3	333 15.6	45.0	350 33.1	134	17 33.4	-88
	5	217 27.6	299 07.9	39.5	198 24.5	12.8	104 11.0	11.4	348 18.0	45.0	5 05.5	135	17 42.2	-87
	6	232 30.1	314 07.4	-20 39.5	213 25.3	+ 8 13.5	119 13.7	+22 11.4	3 20.4	-15 45.0	19 38.0	133	-17 50.9	-86
	7	247 32.6	329 06.9	39.5	228 26.1	14.2	134 16.4	11.4	18 22.8	45.0	34 10.3	134	17 59.5	-86
	8	262 35.0	344 06.4	39.6	243 26.9	14.9	149 19.1	11.5	33 25.2	45.0	48 42.7	133	18 08.1	-84
	9	277 37.5	359 05.9	.. 39.6	258 27.7	.. 15.6	164 21.8	.. 11.5	48 27.6	.. 45.1	63 15.0	133	-18 16.5	-84
	10	292 39.9	14 05.5	39.6	273 28.6	16.3	179 24.6	11.6	63 30.0	45.1	77 47.3	132	18 24.9	-83
	11	307 42.4	29 05.0	39.6	288 29.4	17.0	194 27.3	11.6	78 32.4	45.1	92 19.5	132	18 33.2	-82
	12	322 44.9	44 04.5	-20 39.6	303 30.2	+ 8 17.7	209 30.0	+22 11.7	93 34.8	-15 45.1	106 51.7	132	-18 41.4	-81
	13	337 47.3	59 04.0	39.6	318 31.0	18.4	224 32.7	11.7	108 37.2	45.1	121 23.9	132	18 49.5	-80
	14	352 49.8	74 03.5	39.6	333 31.9	19.1	239 35.4	11.7	123 39.6	45.1	135 56.1	131	18 57.5	-79
	15	7 52.3	89 03.0	.. 39.6	348 32.7	.. 19.8	254 38.2	.. 11.8	138 42.0	.. 45.1	150 28.2	130	-19 05.4	-79
	16	22 54.7	104 02.5	39.6	3 33.5	20.5	269 40.9	11.8	153 44.4	45.1	165 00.2	131	19 13.3	-78
	17	37 57.2	119 02.0	39.6	18 34.3	21.2	284 43.6	11.9	168 46.8	45.1	179 32.3	129	19 21.1	-76
	18	52 59.7	134 01.5	-20 39.6	33 35.1	+ 8 21.9	299 46.3	+22 11.9	183 49.1	-15 45.1	194 04.2	130	-19 28.7	-76
	19	68 02.1	149 01.0	39.6	48 36.0	22.6	314 49.0	11.9	198 51.5	45.1	208 36.2	129	19 36.3	-75
	20	83 04.6	164 00.5	39.6	63 36.8	23.3	329 51.7	12.0	213 53.9	45.2	223 08.1	129	19 43.8	-75
	21	98 07.1	179 00.1	.. 39.6	78 37.6	.. 24.0	344 54.5	.. 12.0	228 56.3	.. 45.2	237 40.0	129	-19 51.3	-73
	22	113 09.5	193 59.6	39.6	93 38.4	24.7	359 57.2	12.1	243 58.7	45.2	252 11.9	128	19 58.6	-72
	23	128 12.0	208 59.1	39.6	108 39.3	25.4	14 59.9	12.1	259 01.1	45.2	266 43.7	127	20 05.8	-72
14	0	143 14.4	223 58.6	-20 39.6	123 40.1	+ 8 26.1	30 02.6	+22 12.1	274 03.5	-15 45.2	281 15.4	128	-20 13.0	-70
	1	158 16.9	238 58.1	39.6	138 40.9	26.8	45 05.3	12.2	289 05.9	45.2	295 47.2	127	20 20.0	-70
	2	173 19.4	253 57.6	39.5	153 41.7	27.5	60 08.0	12.2	304 08.3	45.2	310 18.9	126	20 27.0	-69
	3	188 21.8	268 57.1	.. 39.5	168 42.5	.. 28.2	75 10.7	.. 12.3	319 10.7	.. 45.2	324 50.5	127	-20 33.9	-67
	4	203 24.3	283 56.6	39.5	183 43.4	28.9	90 13.5	12.3	334 13.1	45.2	339 22.2	125	20 40.6	-67
	5	218 26.8	298 56.1	39.5	198 44.2	29.5	105 16.2	12.3	349 15.5	45.2	353 53.7	126	20 47.3	-66
	6	233 29.2	313 55.6	-20 39.5	213 45.0	+ 8 30.2	120 18.9	+22 12.4	4 17.9	-15 45.2	8 25.3	125	-20 53.9	-65
	7	248 31.7	328 55.1	.. 39.5	228 45.8	30.9	135 21.6	12.4	19 20.3	45.2	22 56.8	125	21 00.4	-64
	8	263 34.2	343 54.6	39.5	243 46.6	31.6	150 24.3	12.5	34 22.7	45.3	37 28.3	124	21 06.8	-63
	9	278 36.6	358 54.1	.. 39.5	258 47.5	.. 32.3	165 27.0	.. 12.5	49 25.1	.. 45.3	51 59.7	124	-21 13.1	-62
	10	293 39.1	13 53.6	39.4	273 48.3	33.0	180 29.7	12.5	64 27.5	45.3	66 31.1	124	21 19.3	-61
	11	308 41.6	28 53.1	39.4	288 49.1	33.7	195 32.5	12.6	79 29.9	45.3	81 02.5	123	21 25.4	-60
	12	323 44.0	43 52.6	-20 39.4	303 49.9	+ 8 34.4	210 35.2	+22 12.6	94 32.3	-15 45.3	95 33.8	123	-21 31.4	-60
	13	338 46.5	58 52.1	39.4	318 50.7	35.1	225 37.9	12.6	109 34.7	45.3	110 05.1	122	21 37.4	-58
	14	353 48.9	73 51.6	39.4	333 51.6	35.8	240 40.6	12.7	124 37.1	45.3	124 36.3	122	21 43.2	-57
	15	8 51.4	88 51.1	.. 39.4	348 52.4	.. 36.5	255 43.3	.. 12.7	139 39.5	.. 45.3	139 07.5	122	-21 48.9	-56
	16	23 53.9	103 50.6	39.3	3 53.2	37.2	270 46.0	12.8	154 41.9	45.3	153 38.7	121	21 54.5	-56
	17	38 56.3	118 50.1	39.3	18 54.0	37.9	285 48.							

G M T	SUN			STARS			Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS						
	GHA	Dec.	No.	Name	SHA	Dec.														
										12	13	14	15	Alt.	Sun's Low'r Limb	Venus	Mars			
h	°	'	°		°	'	N	h	m	h	m	h	m	h	m	°	'	°	'	
12	0	176 25.1	-14 01.1	7	Acamar	315 51.5	-40 29.2	72	9 10	5 11	0 54	3 49	■	■	■	Alt.	Sun's Low'r Limb	Venus	Mars	
	1	191 25.1	14 00.3	5	Achernar	335 59.4	-57 28.0	70	8 47	5 16	0 28	2 34	■	■	■	0	'	'	'	
	2	206 25.1	13 59.5	30	Acrux	173 57.9	-62 51.0	68	8 29	5 19	0 08	1 57	4 02	■	■	30	0.5	0.2	0.1	
	3	221 25.1	58.6	19	Adhara	255 46.6	-28 54.8	66	8 15	5 21	25 31	1 31	3 13	5 03	■	40	0.5	0.1	0.1	
	4	236 25.1	57.8	10	Aldebaran	291 39.5	+16 25.3	64	8 04	5 23	25 11	1 11	2 42	4 11	0	75	0.5	0.1	0.0	
	5	251 25.1	57.0					62	7 54	5 25	24 55	0 55	2 19	3 40	45	90	0.5	0.0	0.0	
	6	266 25.1	-13 56.2	32	Alioth	166 58.5	+56 11.8	60	7 46	5 26	24 41	0 41	2 01	3 16	45					
	7	281 25.1	55.3	34	Alkaid	153 33.0	+49 31.8	58	7 38	5 27	24 30	0 30	1 46	2 57	60					
	8	296 25.1	54.5	55	Al Na'ir	28 38.9	-47 10.8	56	7 32	5 28	24 20	0 20	1 33	2 41	75					
	9	311 25.1	53.7	15	Alnilam	276 30.5	-1 13.8	54	7 26	5 28	24 11	0 11	1 21	2 28	90					
	10	326 25.1	52.9	25	Alphard	218 38.7	-8 28.0	52	7 20	5 28	24 03	0 03	1 11	2 16						
	11	341 25.1	52.0					50	7 16	5 28	23 56	25 03	1 03	2 06						
	12	356 25.1	-13 51.2	41	Alphecca	126 48.0	+26 51.6	45	7 05	5 28	23 41	24 44	0 44	1 44						
	13	11 25.1	50.4	1	Alpheratz	358 29.1	+28 50.7	40	6 56	5 27	23 29	24 29	0 29	1 27						
	14	26 25.1	49.6	51	Altair	62 51.1	+8 44.8	35	6 49	5 25	23 19	24 16	0 16	1 12						
	15	41 25.1	48.7	2	Ankaa	353 59.0	-42 33.1	30	6 42	5 22	23 10	24 05	0 05	0 59						
	16	56 25.1	47.9	42	Antares	113 20.0	-26 20.1	20	6 31	5 16	22 54	23 46	24 38	0 38						
	17	71 25.2	47.1					10	6 21	5 10	22 41	23 29	24 19	0 19						
	18	86 25.2	-13 46.2	37	Arcturus	146 35.4	+19 24.6	0	6 11	5 00	22 28	23 14	24 01	0 01						
	19	101 25.2	45.4	43	Atria	109 01.3	-68 56.7	10	6 01	4 49	22 16	22 59	23 44	24 32						
	20	116 25.2	44.6	22	Avior	234 35.4	-59 22.1	20	5 50	4 33	22 02	22 43	23 25	24 12						
	21	131 25.2	43.7	13	Bellatrix	279 18.7	+6 18.6	30	5 38	4 11	21 47	22 24	23 04	23 49						
	22	146 25.2	42.9	16	Betelge'se	271 48.4	+7 24.0	35	5 31	3 58	21 38	22 13	22 52	23 35						
	23	161 25.2	42.1					40	5 23	3 41	21 29	22 01	22 38	23 20						
				17	Canopus	264 15.2	-52 40.5	45	5 13	3 18	21 17	21 46	22 21	23 01						
				12	Capella	281 38.8	+45 57.4	50	5 02	2 46	21 03	21 29	22 00	22 38						
				53	Deneb	50 01.8	+45 07.1	52	4 56	2 30	20 57	21 20	21 50	22 27						
				28	Denebola	183 17.9	+14 49.1	54	4 50	2 08	20 49	21 11	21 39	22 15						
				4	Diphda	349 39.9	-18 14.0	56	4 44	1 40	20 41	21 01	21 26	22 01						
								58	4 36	0 47	20 32	20 49	21 12	21 44						
				27	Dubhe	194 44.4	+61 59.3	60	4 28	///	20 22	20 35	20 54	21 24						
				14	Elnath	279 07.7	+28 34.4	S												
				47	Eltanin	91 06.8	+51 29.3		Lat.	Sunset	Twlt. ends	Moonset								
				54	Enif	34 30.3	+9 40.1		N.	h	m	h	m	h	m	h	m	h	m	
				56	Fomalhaut	16 12.4	-29 51.7		12	13	14	15								
				31	Gacrux	172 49.4	-56 51.7	72	15 21	19 23	6 34	5 12	■	■	■	Alt.	12	13	14	
				29	Gienah	176 37.1	-17 17.7	70	15 43	19 18	7 02	6 29	■	■	■	0	'	'	'	
				35	Hadar	149 49.8	-60 09.4	68	16 00	19 14	7 23	7 08	6 38	■	■	4	17.2	17.4	17.5	
				6	Hamal	328 50.3	+23 15.2	66	16 14	19 11	7 40	7 34	7 28	7 17		12	17.1	17.4	17.5	
				48	Kaus Aust.	84 42.0	-34 24.4	64	16 26	19 09	7 54	7 55	7 59	8 09		16	17.0	17.3	17.4	
								62	16 36	19 08	8 05	8 12	8 23	8 41		20	17.0	17.3	17.3	
				40	Kochab	137 17.6	+74 19.9	60	16 44	19 06	8 15	8 26	8 42	9 05		24	16.9	17.2	17.2	
				57	Markab	14 22.2	+14 57.9	58	16 51	19 04	8 24	8 38	8 57	9 24		28	16.9	17.1	17.2	
				8	Menkar	315 00.8	+3 54.9	56	16 58	19 04	8 32	8 49	9 11	9 40		32	16.8	17.0	17.1	
				36	Menkent	148 59.1	-36 09.0	54	17 04	19 04	8 39	8 58	9 22	9 54		36	16.7	16.9	16.9	
				24	Miapl'dus	221 48.3	-69 32.1	52	17 09	19 03	8 45	9 06	9 33	10 06		40	16.6	16.8	16.8	
								50	17 14	19 03	8 51	9 14	9 42	10 17		44	16.5	16.6	16.7	
				9	Mirfak	309 43.0	+49 42.5	45	17 24	19 03	9 03	9 30	10 01	10 39		48	16.4	16.5	16.6	
				50	Nunki	76 52.7	-26 21.3	40	17 33	19 04	9 13	9 43	10 17	10 57		52	16.2	16.4	16.4	
				52	Peacock	54 28.5	-56 52.8	35	17 40	19 05	9 21	9 54	10 31	11 12		56	16.1	16.2	16.2	
				21	Pollux	244 20.8	+28 08.1	30	17 47	19 08	9 29	10 04	10 43	11 25		60	16.0	16.1	16.1	
				20	Procyon	245 45.1	+5 20.3	20	17 58	19 12	9 42	10 21	11 03	11 47		64	15.8	15.9	15.9	
								10	18 08	19 19	9 54	10 36	11 20	12 07		68	15.7	15.7	15.7	
				46	R'alhague	96 47.2	+12 35.3	0	18 18	19 29	10 05	10 50	11 37	12 25		72	15.6	15.6	15.6	
				26	Regulus	208 29.6	+12 11.0	10	18 27	19 39	10 16	11 04	11 53	12 43		76	15.4	15.4	15.4	
				11	Rigel	281 53.9	-8 15.2	20	18 38	19 55	10 28	11 19	12 11	13 02		80	15.3	15.2	15.2	
				38	Rigel Kent.	140 51.4	-60 39.0	30	18 50	20 15	10 41	11 36	12 31	13 25		84	15.1	15.0	15.0	
				44	Sabik	103 02.8	-15 40.3	35	18 57	20 29	10 49	11 46	12 43	13 38		88	15.0	14.9	14.9	
								40	19 05	20 46	10 58	11 58	12 57	13 53		90				
				3	Schedar	350 30.9	+56 17.8	45	19 14	21 07	11 08	12 12	13 13	14 11						
				45	Shaula	97 21.5	-37 04.3	50	19 26	21 38	11 21	12 28	13 33	14 34						
				18	Sirius	259 12.0	-16 39.4	52	19 31	21 54	11 27	12 36	13 43	14 45						
				33	Spica	159 17.2	-10 55.8	54	19 37	22 15	11 34	12 45	13 54	14 57						
				23	Suhail	223 24.2	-43 15.2	56	19 43	22 41	11 41	12 55	14 06	15 11						
								58	19 51	23 27	11 49	13 06	14 20	15 28						
				49	Vega	81 08.9	+38 44.2	60	19 59	///	11 59	13 19	14 37	15 48						
				39	Zub'g'bi	137 53.8	-15 51.5	S												
	G M T	Equation of Time (App. Mean)						GMT of Transit Meridian of Greenwich												
		12		13		14		DAY		Moon		Venus		Mars		Jupiter		Saturn		
	h	m	s	m	s	m	s		h	m	h	m	h	m	h	m	h	m		
	0	-14	19.6	-14	19.2	-14	18.1		12	3 54	9 03	15 47	22 05	5 51						
	6	-14	19.6	-14	19.0	-14	17.7		13	4 39	9 04	15 46	22 00	5 47						
	12	-14	19.5	-14	18.7	-14	17.2		14	5 25	9 04	15 45	21 56	5 43						
	18	-14	19.4	-14	18.4	-14	16.7		15	6 13	9 05	15 43	21 52	5 39						
	24	-14	19.2	-14	18.1	-14	16.2													
	24	176 26.0	-13 00.9																	
code	-	+ 8																		
											</									

G M T	Υ			VENUS -3.9			MARS 1.3			JUPITER -2.1			SATURN 0.7			MOON							
	GHA			GHA	Dec.		GHA	Dec.		GHA	Dec.		GHA	Dec.		GHA	code	Dec.	code				
15	h	o	'	o	'	o	o	'	o	o	'	o	o	'	o	o		o	'				
0	144	13.6		223	46.6	-20	123	59.8	+8	31	07.7	+22	275	01.1	-15	269	46.7	118	-22	35.9	-47		
1	159	16.0		238	46.1		139	00.6		46	10.4		290	03.5		284	17.5	118	-22	40.6	-47		
2	174	18.5		253	45.6		154	01.4		61	13.1		305	05.9		298	48.3	117	-22	45.3	-45		
3	189	21.0		268	45.1	..	169	02.2	..	76	15.8	..	320	08.3	..	313	19.0	118	-22	49.8	-44		
4	204	23.4		283	44.6		184	03.0		91	18.5		335	10.7		327	49.8	117	-22	54.2	-43		
5	219	25.9		298	44.1		199	03.9		106	21.2		350	13.1		342	20.5	116	-22	58.5	-41		
6	234	28.4		313	43.6	-20	214	04.7	+8	121	23.9	+22	5	15.5	-15	356	51.1	116	-23	02.6	-41		
7	249	30.8		328	43.1		229	05.5		136	26.6		20	17.9		11	21.7	116	-23	06.7	-40		
8	264	33.3		343	42.6		244	06.3		151	29.3		35	20.3		25	52.3	116	-23	10.7	-39		
9	279	35.8		358	42.1	..	259	07.1	..	166	32.0	..	50	22.7	..	40	22.9	115	-23	14.6	-38		
10	294	38.2		13	41.6		274	08.0		181	34.8		65	25.1		54	53.4	114	-23	18.4	-36		
11	309	40.7		28	41.1		289	08.8		196	37.5		80	27.5		69	23.8	115	-23	22.0	-36		
12	324	43.2		43	40.6	-20	304	09.6	+8	211	40.2	+22	95	29.9	-15	83	54.3	114	-23	25.6	-34		
13	339	45.6		58	40.1		319	10.4		226	42.9		110	32.3		98	24.7	114	-23	29.0	-33		
14	354	48.1		73	39.6		334	11.2		241	45.6		125	34.7		112	55.1	113	-23	32.3	-33		
15	9	50.5		88	39.0	..	349	12.1	..	256	48.3	..	140	37.1	..	127	25.4	113	-23	35.6	-31		
16	24	53.0		103	38.5		4	12.9		271	51.0		155	39.5		141	55.7	113	-23	38.7	-30		
17	39	55.5		118	38.0		19	13.7		286	53.7		170	41.9		156	26.0	113	-23	41.7	-29		
18	54	57.9		133	37.5	-20	34	14.5	+8	301	56.4	+22	185	44.3	-15	170	56.3	112	-23	44.6	-28		
19	70	00.4		148	37.0		49	15.3		316	59.1		200	46.7		185	26.5	112	-23	47.4	-26		
20	85	02.9		163	36.5		64	16.2		332	01.8		215	49.1		199	56.7	112	-23	50.0	-26		
21	100	05.3		178	36.0	..	79	17.0	..	347	04.5	..	230	51.5	..	214	26.9	111	-23	52.6	-24		
22	115	07.8		193	35.5		94	17.8		2	07.2		245	53.9		228	57.0	111	-23	55.0	-24		
23	130	10.3		208	35.0		109	18.6		17	09.9		260	56.3		243	27.1	111	-23	57.4	-22		
16	0	145	12.7	223	34.5	-20	124	19.4	+8	32	12.6	+22	275	58.7	-15	257	57.2	110	-23	59.6	-21		
1	160	15.2		238	33.9		139	20.2	9	00.0		47	15.3		291	01.1		272	27.2	110	-24	01.7	-20
2	175	17.7		253	33.4		154	21.1		62	18.0		306	03.5		286	57.2	110	-24	03.7	-19		
3	190	20.1		268	32.9	..	169	21.9	..	77	20.7	..	321	06.0	..	301	27.2	110	-24	05.6	-18		
4	205	22.6		283	32.4		184	22.7		92	23.4		336	08.4		315	57.2	109	-24	07.4	-16		
5	220	25.0		298	31.9		199	23.5		107	26.1		351	10.8		330	27.1	109	-24	09.0	-16		
6	235	27.5		313	31.4	-20	214	24.3	+9	122	28.8	+22	6	13.2	-15	344	57.0	109	-24	10.6	-14		
7	250	30.0		328	30.9		229	25.2		137	31.5		21	15.6		359	26.9	109	-24	12.0	-13		
8	265	32.4		343	30.4		244	26.0		152	34.2		36	18.0		13	56.8	108	-24	13.3	-12		
9	280	34.9		358	29.8	..	259	26.8	..	167	36.9	..	51	20.4	..	28	26.6	108	-24	14.5	-11		
10	295	37.4		13	29.3		274	27.6		182	39.6		66	22.8		42	56.4	108	-24	15.6	-10		
11	310	39.8		28	28.8		289	28.4		197	42.3		81	25.2		57	26.2	108	-24	16.6	-8		
12	325	42.3		43	28.3	-20	304	29.2	+9	212	45.0	+22	96	27.6	-15	71	56.0	107	-24	17.4	-8		
13	340	44.8		58	27.8		319	30.1		227	47.7		111	30.0		86	25.7	108	-24	18.2	-6		
14	355	47.2		73	27.3		334	30.9		242	50.4		126	32.4		100	55.5	107	-24	18.8	-5		
15	10	49.7		88	26.8	..	349	31.7	..	257	53.1	..	141	34.8	..	115	25.2	107	-24	19.3	-4		
16	25	52.1		103	26.2		4	32.5		272	55.8		156	37.2		129	54.9	106	-24	19.7	-3		
17	40	54.6		118	25.7		19	33.3		287	58.5		171	39.6		144	24.5	107	-24	20.0	-1		
18	55	57.1		133	25.2	-20	34	34.2	+9	303	01.2	+22	186	42.0	-15	158	54.2	106	-24	20.1	0		
19	70	59.5		148	24.7		49	35.0		318	03.9		201	44.5		173	23.8	106	-24	20.1	0		
20	86	02.0		163	24.2		64	35.8		333	06.6		216	46.9		187	53.4	106	-24	20.1	+2		
21	101	04.5		178	23.7	..	79	36.6	..	348	09.3	..	231	49.3	..	202	23.0	106	-24	19.9	+4		
22	116	06.9		193	23.1		94	37.4		3	12.0		246	51.7		216	52.6	106	-24	19.5	+4		
23	131	09.4		208	22.6		109	38.2		18	14.7		261	54.1		231	22.2	106	-24	19.1	+6		
17	0	146	11.9	223	22.1	-20	124	39.1	+9	33	17.4	+22	276	56.5	-15	245	51.8	105	-24	18.5	+6		
1	161	14.3		238	21.6		139	39.9		48	20.0		291	58.9		260	21.3	105	-24	17.9	+8		
2	176	16.8		253	21.1		154	40.7		63	22.7		307	01.3		274	50.8	105	-24	17.1	+9		
3	191	19.3		268	20.6	..	169	41.5	..	78	25.4	..	322	03.7	..	289	20.3	105	-24	16.2	+11		
4	206	21.7		283	20.0		184	42.3		93	28.1		337	06.1		303	49.8	105	-24	15.1	+11		
5	221	24.2		298	19.5		199	43.1		108	30.8		352	08.5		318	19.3	105	-24	14.0	+13		
6	236	26.6		313	19.0	-20	214	44.0	+9	123	33.5	+22	7	11.0	-15	332	48.8	105	-24	12.7	+14		
7	251	29.1		328	18.5		229	44.8		138	36.2		22	13.4		347	18.3	105	-24	11.3	+15		
8	266	31.6		343	18.0		244	45.6		153	38.9		37	15.8		1	47.8	104	-24	09.8	+16		
9	281	34.0		358	17.4	..	259	46.4	..	168	41.6	..	52	18.2	..	16	17.2	105	-24	08.2	+17		
10	296	36.5		13	16.9		274	47.2		183	44.3		67	20.6		30	46.7	104	-24	06.5	+19		
11	311	39.0		28	16.4		289	48.0		198	47.0		82	23.0		45	16.1	104	-24	04.6	+20		
12	326	41.4		43	15.9	-20	304	48.9	+9	213	49.7	+22	97	25.4	-15	59	45.5	105	-24	02.6	+21		
13	341	43.9		58	15.4		319	49.7		228	52.4		112	27.8		74	15.0	104	-24	00.5	+22		
14	356	46.4		73	14.8		334	50.5		243	55.0		127	30.2		88	44.4	104	-23	58.3	+23		
15	11	48.8		88	14.3	..	349	51.3	..	258	57.7	..	142	32.6	..	103	13.8	104	-23	56.0	+25		
16	26	51.3		103	13.8		4	52.1		274	00.4		157	35.1		117	43.2	104	-23	53.5	+26		
17	41	53.8		118	13.3		19	52.9		289	03.1		172	37.5		132	12.6	104	-23	50.9	+27		
18	56	56.2		133	12.7	-20	34	53.7	+9	304	05.8	+22	187	39.9	-15	146	42.0	105	-23	48.2	+28		
19	71	58.7		148	12.2		49	54.6		319	08.5		202	42.3		161	11.5	104	-23	45.4	+29		
20	87	01.1		163	11.7		64	55.4		334	11.2		217	44.7		175	40.9	104	-23	42.5	+31		
21	102	03.6		178	11.2	..	79	56.2	..	349	13.9	..	232	47.1	..	190	10.3	104	-23	39.4	+32		
22	117	06.1		193	10.6		94	57.0		4	1												

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.	No.	Name	SHA	Dec.													
										15	16	17	18	Alt.	Sun's Low'r Limb	Venus	Mars		
h	°	'	°	'	°	'	N	h	m	h	m	h	m	h	m	°	'	'	'
15	0	176 26.0	-13 00.9	7	Acamar	315 51.5	-40 29.2	72	8 52	4 59	■	■	■	■	■	Alt.			
	1	191 26.0	13 00.0	5	Achernar	335 59.4	-57 28.0	70	8 32	5 04	■	■	■	■	■	Sun's Add			
	2	206 26.0	12 59.2	30	Acrux	173 57.8	-62 51.0	68	8 17	5 09	■	■	■	■	■	Add			
	3	221 26.0	.. 58.3	19	Adhara	255 46.6	-28 54.8	66	8 04	5 12	5 03	■	■	■	7 34				
	4	236 26.1	57.5	10	Aldebaran	291 39.5	+16 25.3	64	7 54	5 15	4 11	5 29	6 20	6 44	0				
	5	251 26.1	56.6					62	7 45	5 17	3 40	4 49	5 41	6 13	30	0.5	0.2	0.1	
	6	266 26.1	-12 55.8	32	Alioth	166 58.5	+56 11.8	60	7 37	5 19	3 16	4 22	5 13	5 49	45	0.5	0.1	0.1	
	7	281 26.1	54.9	34	Alkaid	153 32.9	+49 31.8	58	7 31	5 20	2 57	4 01	4 52	5 31	60	0.5	0.1	0.1	
	8	296 26.2	54.1	55	Al Na'ir	28 38.9	-47 10.8	56	7 25	5 21	2 41	3 43	4 34	5 15	75	0.5	0.1	0.0	
	9	311 26.2	.. 53.2	15	Alnilam	276 30.5	-1 13.8	54	7 19	5 23	2 28	3 28	4 20	5 01	90	0.5	0.0	0.0	
	10	326 26.2	52.4	25	Alphard	218 38.7	-8 28.0	52	7 15	5 23	2 16	3 15	4 07	4 49					
	11	341 26.2	51.5					50	7 10	5 23	2 06	3 04	3 55	4 39	Moon's Lower Limb				
	12	356 26.3	-12 50.6	41	Alphecca	126 48.0	+26 51.6	45	7 01	5 23	1 44	2 40	3 32	4 17	Add				
	13	11 26.3	49.8	1	Alpheratz	358 29.1	+28 50.7	40	6 53	5 23	1 27	2 22	3 13	3 59	Alt.	15	16	17	
	14	26 26.3	48.9	51	Altair	62 51.1	+8 44.8	35	6 46	5 22	1 12	2 06	2 57	3 44	0				
	15	41 26.3	.. 48.1	2	Ankaa	353 59.0	-42 33.1	30	6 40	5 21	0 59	1 52	2 43	3 31	4	12.1	12.2	12.8	
	16	56 26.4	47.2	42	Antares	113 20.0	-26 20.1	20	6 29	5 16	0 38	1 29	2 20	3 08	8	12.1	12.3	12.8	
	17	71 26.4	46.4					10	6 20	5 09	0 19	1 09	1 59	2 49	12	12.2	12.3	12.8	
	18	86 26.4	-12 45.5	37	Arcturus	146 35.4	+19 24.6	0	6 11	5 01	0 01	0 50	1 40	2 31	16	12.2	12.4	12.9	
	19	101 26.5	44.7	43	Atria	109 01.3	-68 56.7	10	6 02	4 50	24 32	0 32	1 21	2 13	20	12.2	12.4	12.9	
	20	116 26.5	43.8	22	Avior	234 35.4	-59 22.1	20	5 52	4 34	24 12	0 12	1 01	1 54	24	12.3	12.4	12.9	
	21	131 26.5	.. 42.9	13	Bellatrix	279 18.7	+6 18.6	30	5 40	4 15	23 49	24 38	0 38	1 31	28	12.4	12.5	13.0	
	22	146 26.6	42.1	16	Betelge'se	271 48.4	+7 24.0	35	5 34	4 02	23 35	24 24	0 24	1 18	32	12.5	12.6	13.0	
	23	161 26.6	41.2					40	5 26	3 45	23 20	24 08	0 08	1 03	36	12.6	12.7	13.1	
				17	Canopus	264 15.2	-52 40.5	45	5 18	3 24	23 01	23 49	24 45	0 45	40	12.7	12.8	13.2	
				12	Capella	281 38.9	+45 57.4	50	5 07	2 55	22 38	23 26	24 22	0 22	44	12.8	12.9	13.3	
				53	Deneb	50 01.7	+45 07.1	52	5 02	2 39	22 27	23 15	24 12	0 12	48	12.9	13.0	13.4	
				28	Denebola	183 17.9	+14 49.1	54	4 56	2 20	22 15	23 02	23 59	25 07	52	13.1	13.2	13.5	
				4	Diphda	349 39.9	-18 14.0	56	4 50	1 56	22 01	22 47	23 45	24 55	56	13.2	13.3	13.7	
								58	4 43	1 19	21 44	22 29	23 29	24 41	60	13.3	13.4	13.8	
				27	Dubhe	194 44.4	+61 59.4	60	4 35	///	21 24	22 08	23 09	24 24	64	13.5	13.6	13.9	
				14	Elnath	279 07.7	+28 34.4	S							68	13.7	13.8	14.1	
				47	Eltanin	91 06.7	+51 29.3								72	13.9	14.0	14.2	
				54	Enif	34 30.3	+9 40.1								76	14.1	14.1	14.3	
				56	Fomalhaut	16 12.4	-29 51.7								80	14.3	14.3	14.5	
				31	Gacrux	172 49.3	-56 51.7	72	15 38	19 36	■	■	■	■	84	14.4	14.5	14.6	
				29	Gienah	176 37.0	-17 17.7	70	15 58	19 30	■	■	■	■	88	14.6	14.7	14.8	
				35	Hadar	149 49.8	-60 09.4	68	16 13	19 25	■	■	■	■	90	14.8	14.8	14.9	
				6	Hamal	328 50.3	+23 15.2	66	16 25	19 20	7 17	■	■	9 58	Add to table, back cover				
				48	Kaus Aust.	84 42.0	-34 24.4	64	16 36	19 18	8 09	8 34	9 27	10 48	Moon's Upper Limb				
				40	Kochab	137 17.5	+74 19.9	60	16 52	19 13	9 05	9 41	10 34	11 43	Subtract				
				57	Markab	14 22.2	+14 57.8	58	16 59	19 12	9 24	10 03	10 55	12 01	Alt.	15	16	17	
				8	Menkar	315 00.8	+3 54.9	56	17 05	19 10	9 40	10 20	11 12	12 17	0	17.5	17.4	17.2	
				36	Menkent	148 59.0	-36 09.0	54	17 10	19 09	9 54	10 35	11 27	12 30	4	17.5	17.4	17.1	
				24	Miap'ldus	221 48.3	-69 32.1	52	17 15	19 09	10 06	10 48	11 40	12 42	8	17.4	17.4	17.1	
								50	17 19	19 08	10 17	10 59	11 51	12 52	12	17.4	17.3	17.0	
				9	Mirfak	309 43.0	+49 42.5	45	17 28	19 07	10 39	11 23	12 15	13 13	16	17.3	17.3	17.0	
				50	Nunki	76 52.7	-26 21.2	40	17 36	19 07	10 57	11 42	12 34	13 31	20	17.2	17.2	16.9	
				52	Peacock	54 28.5	-56 52.8	35	17 43	19 08	11 12	11 58	12 49	13 45	24	17.2	17.1	16.9	
				21	Pollux	244 20.8	+28 08.1	30	17 49	19 09	11 25	12 12	13 03	13 58	28	17.1	17.0	16.8	
				20	Procyon	245 45.1	+5 20.3	20	18 00	19 14	11 47	12 35	13 26	14 19	32	16.9	16.9	16.7	
								10	18 09	19 20	12 07	12 56	13 46	14 38	36	16.8	16.8	16.6	
				46	R'alhague	96 47.2	+12 35.3	0	18 18	19 28	12 25	13 14	14 05	14 55	40	16.7	16.6	16.5	
				26	Regulus	208 29.6	+12 11.0	10	18 26	19 38	12 43	13 33	14 23	15 13	44	16.6	16.5	16.4	
				11	Rigel	281 53.9	-8 15.2	20	18 36	19 52	13 02	13 54	14 43	15 31	48	16.4	16.4	16.2	
				38	Rigel Kent	140 51.4	-60 39.0	30	18 47	20 12	13 25	14 17	15 06	15 52	52	16.2	16.2	16.1	
				44	Sabik	103 02.8	-15 40.3	35	18 54	20 25	13 38	14 31	15 20	16 04	56	16.1	16.1	16.0	
								40	19 01	20 41	13 53	14 46	15 35	16 18	60	15.9	15.9	15.8	
				3	Schedar	350 30.9	+56 17.7	45	19 10	21 02	14 11	15 05	15 53	16 35	64	15.7	15.7	15.7	
				45	Shaula	97 21.4	-37 04.3	50	19 20	21 29	14 34	15 29	16 16	16 56	68	15.6	15.6	15.6	
				18	Sirius	259 12.0	-16 39.4	52	19 25	21 44	14 45	15 40	16 27	17 05	72	15.4	15.4	15.4	
				33	Spica	159 17.2	-10 55.8	54	19 31	22 03	14 57	15 53	16 40	17 16	76	15.2	15.2	15.3	
				23	Suhail	223 24.2	-43 15.2	56	19 37	22 26	15 11	16 08	16 54	17 29	80	15.0	15.0	15.1	
								58	19 43	22 59	15 28	16 26	17 10	17 43	84	14.9	14.9	15.0	
				49	Vega	81 08.8	+38 44.2	60	19 51	///	15 48	16 47	17 31	18 00	88				
				39	Zub'g'bi	137 53.8	-15 51.5	S							90				
				Equation of Time (App.—Mean)				GMT of Transit				Meridian of Greenwich							
				h	m	s	m	s	m	s	DAY	Moon	Venus	Mars	Jupiter	Saturn	Subtract from table, back cover		

G M T	T		VENUS -3.8		MARS 1.4		JUPITER -2.1		SATURN 0.7		MOON			
	GHA		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'
18	0	147 11.0	223 09.6	-20 34.7	124 58.6	+ 9 32.1	34 21.9	+22 15.7	277 54.4	-15 45.8	233 38.5	104	-23 29.5	+ 35
	1	162 13.5	238 09.1	34.6	139 59.5	32.8	49 24.6	15.8	292 56.8	45.8	248 07.9	104	23 26.0	+ 37
	2	177 15.9	253 08.5	34.5	155 00.3	33.5	64 27.3	15.8	307 59.2	45.8	262 37.3	104	23 22.3	+ 37
	3	192 18.4	268 08.0	34.4	170 01.1	34.2	79 30.0	15.8	323 01.6	45.8	277 06.7	105	23 18.6	+ 39
	4	207 20.9	283 07.5	34.3	185 01.9	34.9	94 32.7	15.9	338 04.0	45.8	291 36.2	104	23 14.7	+ 40
	5	222 23.3	298 07.0	34.3	200 02.7	35.6	109 35.4	15.9	353 06.4	45.8	306 05.6	104	23 10.7	+ 41
	6	237 25.8	313 06.4	-20 34.2	215 03.5	+ 9 36.2	124 38.0	+22 15.9	8 08.8	-15 45.8	320 35.0	105	-23 06.6	+ 43
	7	252 28.3	328 05.9	34.1	230 04.3	36.9	139 40.7	16.0	23 11.3	45.8	335 04.5	104	23 02.3	+ 43
	8	267 30.7	343 05.4	34.0	245 05.2	37.6	154 43.4	16.0	38 13.7	45.8	349 33.9	105	22 58.0	+ 45
	9	282 33.2	358 04.9	33.8	260 06.0	38.3	169 46.1	16.0	53 16.1	45.8	4 03.4	104	-22 53.5	+ 46
	10	297 35.6	13 04.3	33.7	275 06.8	39.0	184 48.8	16.1	68 18.5	45.8	18 32.8	105	22 48.9	+ 47
	11	312 38.1	28 03.8	33.6	290 07.6	39.6	199 51.5	16.1	83 20.9	45.8	33 02.3	105	22 44.2	+ 48
	12	327 40.6	43 03.3	-20 33.5	305 08.4	+ 9 40.3	214 54.2	+22 16.2	98 23.3	-15 45.8	47 31.8	105	-22 39.4	+ 50
	13	342 43.0	58 02.7	33.4	320 09.2	41.0	229 56.8	16.2	113 25.7	45.8	62 01.3	105	22 34.4	+ 51
	14	357 45.5	73 02.2	33.3	335 10.0	41.7	244 59.5	16.2	128 28.2	45.8	76 30.8	105	22 29.3	+ 51
	15	12 48.0	88 01.7	33.2	350 10.9	42.3	260 02.2	16.3	143 30.6	45.9	91 00.3	105	-22 24.2	+ 53
	16	27 50.4	103 01.2	33.1	5 11.7	43.0	275 04.9	16.3	158 33.0	45.9	105 29.8	105	22 18.9	+ 54
	17	42 52.9	118 00.6	33.0	20 12.5	43.7	290 07.6	16.3	173 35.4	45.9	119 59.3	106	22 13.5	+ 56
	18	57 55.4	133 00.1	-20 32.9	35 13.3	+ 9 44.4	305 10.3	+22 16.4	188 37.8	-15 45.9	134 28.9	105	-22 07.9	+ 56
	19	72 57.8	147 59.6	32.8	50 14.1	45.1	320 12.9	16.4	203 40.2	45.9	148 58.4	106	22 02.3	+ 57
	20	88 00.3	162 59.0	32.7	65 14.9	45.7	335 15.6	16.4	218 42.7	45.9	163 28.0	106	21 56.6	+ 59
	21	103 02.8	177 58.5	32.6	80 15.7	46.4	350 18.3	16.5	233 45.1	45.9	177 57.6	106	-21 50.7	+ 60
	22	118 05.2	192 58.0	32.4	95 16.6	47.1	5 21.0	16.5	248 47.5	45.9	192 27.2	106	21 44.7	+ 61
	23	133 07.7	207 57.5	32.3	110 17.4	47.8	20 23.7	16.5	263 49.9	45.9	206 56.8	106	21 38.6	+ 62
19	0	148 10.1	222 56.9	-20 32.2	125 18.2	+ 9 48.4	35 26.3	+22 16.6	278 52.3	-15 45.9	221 26.4	106	-21 32.4	+ 63
	1	163 12.6	237 56.4	32.1	140 19.0	49.1	50 29.0	16.6	293 54.7	45.9	235 56.0	107	21 26.1	+ 64
	2	178 15.1	252 55.9	32.0	155 19.8	49.8	65 31.7	16.6	308 57.2	45.9	250 25.7	107	21 19.7	+ 66
	3	193 17.5	267 55.3	31.9	170 20.6	50.5	80 34.4	16.7	323 59.6	45.9	264 55.4	107	-21 13.1	+ 67
	4	208 20.0	282 54.8	31.7	185 21.4	51.2	95 37.1	16.7	339 02.0	45.9	279 25.1	107	21 06.4	+ 67
	5	223 22.5	297 54.3	31.6	200 22.3	51.8	110 39.7	16.7	354 04.4	45.9	293 54.8	107	20 59.7	+ 69
	6	238 24.9	312 53.7	-20 31.5	215 23.1	+ 9 52.5	125 42.4	+22 16.8	9 06.8	-15 45.9	308 24.5	107	-20 52.8	+ 70
	7	253 27.4	327 53.2	31.4	230 23.9	53.2	140 45.1	16.8	24 09.3	45.9	322 54.2	108	20 45.8	+ 71
	8	268 29.9	342 52.7	31.2	245 24.7	53.9	155 47.8	16.8	39 11.7	45.9	337 24.0	108	20 38.7	+ 72
	9	283 32.3	357 52.1	31.1	260 25.5	54.5	170 50.4	16.9	54 14.1	45.9	351 53.8	108	-20 31.5	+ 73
	10	298 34.8	12 51.6	31.0	275 26.3	55.2	185 53.1	16.9	69 16.5	45.9	6 23.6	108	20 24.2	+ 74
	11	313 37.2	27 51.1	30.9	290 27.1	55.9	200 55.8	16.9	84 18.9	45.9	20 53.4	108	20 16.8	+ 76
	12	328 39.7	42 50.5	-20 30.7	305 27.9	+ 9 56.6	215 58.5	+22 17.0	99 21.3	-15 45.9	35 23.2	109	-20 09.2	+ 76
	13	343 42.2	57 50.0	30.6	320 28.8	57.2	231 01.2	17.0	114 23.8	45.9	49 53.1	109	20 01.6	+ 78
	14	358 44.6	72 49.5	30.5	335 29.6	57.9	246 03.8	17.0	129 26.2	45.9	64 23.0	108	19 53.8	+ 78
	15	13 47.1	87 48.9	30.4	350 30.4	58.6	261 06.5	17.1	144 28.6	45.9	78 52.8	110	-19 46.0	+ 80
	16	28 49.6	102 48.4	30.2	5 31.2	59.3	276 09.2	17.1	159 31.0	45.9	93 22.8	109	19 38.0	+ 80
	17	43 52.0	117 47.9	30.1	20 32.0	9 59.9	291 11.9	17.1	174 33.4	45.9	107 52.7	110	19 30.0	+ 82
	18	58 54.5	132 47.3	-20 30.0	35 32.8	+10 00.6	306 14.5	+22 17.2	189 35.9	-15 45.9	122 22.7	109	-19 21.8	+ 83
	19	73 57.0	147 46.8	29.8	50 33.6	01.3	321 17.2	17.2	204 38.3	45.9	136 52.6	110	19 13.5	+ 84
	20	88 59.4	162 46.3	29.7	65 34.4	02.0	336 19.9	17.2	219 40.7	45.9	151 22.6	111	19 05.1	+ 85
	21	104 01.9	177 45.7	29.6	80 35.3	02.6	351 22.5	17.3	234 43.1	45.9	165 52.7	110	-18 56.6	+ 85
	22	119 04.4	192 45.2	29.4	95 36.1	03.3	6 25.2	17.3	249 45.6	45.9	180 22.7	111	18 48.1	+ 87
	23	134 06.8	207 44.7	29.3	110 36.9	04.0	21 27.9	17.3	264 48.0	45.9	194 52.8	110	18 39.4	+ 88
20	0	149 09.3	222 44.1	-20 29.1	125 37.7	+10 04.7	36 30.6	+22 17.4	279 50.4	-15 45.9	209 22.8	111	-18 30.6	+ 89
	1	164 11.7	237 43.6	29.0	140 38.5	05.3	51 33.2	17.4	294 52.8	45.9	223 52.9	112	18 21.7	+ 90
	2	179 14.2	252 43.0	28.9	155 39.3	06.0	66 35.9	17.4	309 55.2	45.9	238 23.1	111	18 12.7	+ 91
	3	194 16.7	267 42.5	28.7	170 40.1	06.7	81 38.6	17.5	324 57.7	45.9	252 53.2	112	-18 03.6	+ 92
	4	209 19.1	282 42.0	28.6	185 40.9	07.3	96 41.3	17.5	340 00.1	45.9	267 23.4	112	17 54.4	+ 93
	5	224 21.6	297 41.4	28.4	200 41.7	08.0	111 43.9	17.5	355 02.5	45.9	281 53.6	112	17 45.1	+ 93
	6	239 24.1	312 40.9	-20 28.3	215 42.6	+10 08.7	126 46.6	+22 17.5	10 04.9	-15 45.9	296 23.8	112	-17 35.8	+ 95
	7	254 26.5	327 40.4	28.1	230 43.4	09.4	141 49.3	17.6	25 07.4	45.9	310 54.0	113	17 26.3	+ 96
	8	269 29.0	342 39.8	28.0	245 44.2	10.0	156 51.9	17.6	40 09.8	46.0	325 24.3	113	17 16.7	+ 97
	9	284 31.5	357 39.3	27.9	260 45.0	10.7	171 54.6	17.6	55 12.2	46.0	339 54.6	113	-17 07.0	+ 97
	10	299 33.9	12 38.7	27.7	275 45.8	11.4	186 57.3	17.7	70 14.6	46.0	354 24.9	113	16 57.3	+ 99
	11	314 36.4	27 38.2	27.6	290 46.6	12.1	201 59.9	17.7	85 17.0	46.0	8 55.2	114	16 47.4	+ 99
	12	329 38.9	42 37.7	-20 27.4	305 47.4	+10 12.7	217 02.6	+22 17.7	100 19.5	-15 46.0	23 25.6	113	-16 37.5	+101
	13	344 41.3	57 37.1	27.3	320 48.2	13.4	232 05.3	17.8	115 21.9	46.0	37 55.9	114	16 27.4	+101
	14	359 43.8	72 36.6	27.1	335 49.0	14.1	247 08.0	17.8	130 24.3	46.0	52 26.3	114	16 17.3	+102
	15	14 46.2	87 36.0	27.0	350 49.9	14.7	262 10.6	17.8	145 26.7	46.0	66 56.7	115	-16 07.1	+104
	16	29 48.7	102 35.5	26.8	5 50.7	15.4	277 13.3	17.9	160 29.2	46.0	81 27.2	114	15 56.7	+104
	17	44 51.2	117 35.0	26.6	20 51.5	16.1	292 16.0	17.9	175 31.6	46.0	95 57.6	115	15 46.3	+105
	18	59 53.6	132											

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.	No.	Name	SHA	Dec.								Alt.	Sun's Lower Limb	Venus	Mars		
										18	19	20	21					Add	Add
h	°	'	°				N	h	m	h	m	h	m	h	m	°	'	°	'
18 0	176	28.4	-11 58.7	7	Acamar	315 51.5	-40 29.2	72	8 35	4 45	■	■	9 10	8 09					
1 1	191	28.5	57.9	5	Achernar	335 59.4	-57 28.0	70	8 18	4 53	■	■	8 16	7 45					
2 2	206	28.5	57.0	30	Acrux	173 57.8	-62 51.1	68	8 04	4 59	■	■	8 09	7 42					
3 3	221	28.6	56.1	19	Adhara	255 46.6	-28 54.8	66	7 53	5 03	7 34	7 24	7 18	7 12					
4 4	236	28.6	55.2	10	Aldebaran	291 39.5	+16 25.3	64	7 44	5 06	6 44	6 54	6 58	7 00					
5 5	251	28.7	54.3					62	7 36	5 09	6 13	6 31	6 42	6 49					
6 6	266	28.7	-11 53.5	32	Alioth	166 58.4	+56 11.8	60	7 29	5 12	5 49	6 13	6 29	6 40					
7 7	281	28.8	52.6	34	Alkaid	153 32.9	+49 31.8	58	7 23	5 14	5 31	5 58	6 18	6 33					
8 8	296	28.8	51.7	55	Al Na'ir	28 38.9	-47 10.7	56	7 18	5 15	5 15	5 45	6 08	6 26					
9 9	311	28.9	50.8	15	Alnilam	276 30.6	-1 13.8	54	7 13	5 16	5 01	5 33	5 59	6 19					
10 10	326	28.9	50.0	25	Alphard	218 38.7	-8 28.0	52	7 09	5 18	4 49	5 23	5 51	6 14					
11 11	341	29.0	49.1					50	7 05	5 19	4 39	5 14	5 44	6 09					
12 12	356	29.0	-11 48.2	41	Alphecca	126 47.9	+26 51.5	45	6 56	5 20	4 17	4 55	5 29	5 57					
13 13	11	29.1	47.3	1	Alpheratz	358 29.1	+28 50.7	40	6 49	5 19	3 59	4 40	5 16	5 48					
14 14	26	29.1	46.4	51	Altair	62 51.1	+8 44.8	35	6 43	5 19	3 44	4 26	5 05	5 40					
15 15	41	29.2	45.6	2	Ankaa	353 59.0	-42 33.1	30	6 37	5 18	3 31	4 15	4 56	5 33					
16 16	56	29.2	44.7	42	Antares	113 19.9	-26 20.1	20	6 27	5 14	3 08	3 55	4 39	5 21					
17 17	71	29.3	43.8					10	6 19	5 08	2 49	3 38	4 25	5 10					
18 18	86	29.3	-11 42.9	37	Arcturus	146 35.4	+19 24.6	0	6 11	5 01	2 31	3 22	4 11	5 00					
19 19	101	29.4	42.0	43	Atria	109 01.2	-68 56.7	10	6 02	4 50	2 13	3 05	3 58	4 50					
20 20	116	29.4	41.1	22	Avior	234 35.4	-59 22.1	20	5 53	4 37	1 54	2 48	3 43	4 39					
21 21	131	29.5	40.3	13	Bellatrix	279 18.7	+6 18.6	30	5 43	4 18	1 31	2 28	3 27	4 27					
22 22	146	29.5	39.4	16	Betelgeuse	271 48.4	+7 24.0	35	5 37	4 06	1 18	2 16	3 17	4 20					
23 23	161	29.6	38.5					40	5 30	3 50	1 03	2 03	3 06	4 11					
				17	Canopus	264 15.2	-52 40.5	45	5 22	3 31	0 45	1 47	2 53	4 02					
				12	Capella	281 38.9	+45 57.5	50	5 12	3 04	0 22	1 27	2 37	3 50					
				53	Deneb	50 01.7	+45 07.1	52	5 08	2 49	0 12	1 17	2 29	3 45					
				28	Denebola	183 17.8	+14 49.1	54	5 03	2 33	25 07	1 07	2 21	3 39					
				4	Diphda	349 39.9	-18 14.0	56	4 57	2 11	24 55	0 55	2 11	3 32					
								58	4 51	1 43	24 41	0 41	2 01	3 24					
				27	Dubhe	194 44.4	+61 59.4	60	4 44	0 49	24 24	0 24	1 48	3 16					
				14	Elnath	279 07.7	+28 34.4	S											
				47	Eltanin	91 06.7	+51 29.3												
				54	Enif	34 30.3	+9 40.1												
				56	Fomalhaut	16 12.4	-29 51.7												
								N	h	m	h	m	h	m	h	m			
				31	Gacrux	172 49.3	-56 51.7	72	15 55	19 49	■	■	11 54	14 38					
				29	Gienah	176 37.0	-17 17.8	70	16 12	19 42	■	■	12 48	15 00					
				35	Hadar	149 49.8	-60 09.4	68	16 25	19 35	■	11 10	13 20	15 17					
				6	Hamal	328 50.3	+23 15.2	66	16 36	19 30	9 58	11 54	13 43	15 30					
				48	Kaus Aust.	84 42.0	-34 24.4	64	16 45	19 26	10 48	12 23	14 02	15 41					
								62	16 53	19 23	11 19	12 45	14 17	15 50					
				40	Kochab	137 17.5	+74 19.9	60	17 00	19 20	11 43	13 03	14 29	15 58					
				57	Markab	14 22.2	+14 57.8	58	17 06	19 18	12 01	13 18	14 40	16 05					
				8	Menkar	315 00.8	+3 54.9	56	17 11	19 16	12 17	13 30	14 49	16 11					
				36	Menkent	148 59.0	-36 09.0	54	17 16	19 15	12 30	13 41	14 57	16 17					
				24	Miap'dus	221 48.3	-69 32.1	52	17 20	19 13	12 42	13 51	15 05	16 21					
								50	17 24	19 12	12 52	13 59	15 11	16 26					
				9	Mirfak	309 43.1	+49 42.4	45	17 33	19 11	13 13	14 18	15 25	16 35					
				50	Nunki	76 52.7	-26 21.2	40	17 40	19 11	13 31	14 33	15 37	16 43					
				52	Peacock	54 28.4	-56 52.7	35	17 46	19 11	13 45	14 45	15 47	16 50					
				21	Pollux	244 20.8	+28 08.1	30	17 51	19 11	13 58	14 56	15 55	16 56					
				20	Procyon	245 45.2	+5 20.3	20	18 01	19 15	14 19	15 14	16 10	17 06					
								10	18 09	19 20	14 38	15 31	16 23	17 15					
				46	R'alhague	96 47.1	+12 35.3	0	18 17	19 27	14 55	15 46	16 35	17 23					
				26	Regulus	208 29.6	+12 11.0	10	18 25	19 37	15 13	16 01	16 47	17 31					
				11	Rigel	281 53.9	-8 15.2	20	18 34	19 50	15 31	16 16	16 59	17 40					
				38	Rigel Kent.	140 51.4	-60 39.0	30	18 44	20 08	15 52	16 34	17 13	17 50					
				44	Sabik	103 02.8	-15 40.3	35	18 50	20 20	16 04	16 45	17 22	17 55					
								40	18 57	20 35	16 18	16 57	17 31	18 02					
				3	Schedar	350 30.9	+56 17.7	45	19 05	20 55	16 35	17 11	17 42	18 09					
				45	Shaula	97 21.4	-37 04.3	50	19 15	21 21	16 56	17 28	17 55	18 18					
				18	Sirius	259 12.0	-16 39.4	52	19 19	21 34	17 05	17 36	18 01	18 22					
				33	Spica	159 17.1	-10 55.8	54	19 24	21 51	17 16	17 45	18 08	18 26					
				23	Suhail	223 24.2	-43 15.2	56	19 29	22 11	17 29	17 55	18 15	18 31					
								58	19 35	22 38	17 43	18 06	18 23	18 37					
				49	Vega	81 08.8	+38 44.2	60	19 42	23 22	18 00	18 20	18 33	18 43					
				39	Zub'g'bi	137 53.7	-15 51.5	S											
				Equation of Time (App.—Mean)				GMT of Transit Meridian of Greenwich											

G M T	VENUS -3.8			MARS 1.4			JUPITER -2.1			SATURN 0.7			MOON			
	GHA	GHA	Dec.	GHA	GHA	Dec.	GHA	GHA	Dec.	GHA	GHA	Dec.	GHA	code	Dec.	code
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	°	'
21 0	150 08.4	222 31.2	-20 25.5	125 57.1	+10 20.8	37 34.6	+22 18.1	280 48.6	-15 46.0	197 31.4	116	-14 31.0	+110			
1	165 10.9	237 30.6	25.4	140 58.0	21.4	52 37.3	18.2	295 51.0	46.0	212 02.0	117	14 20.0	+112			
2	180 13.3	252 30.1	25.2	155 58.8	22.1	67 39.9	18.2	310 53.4	46.0	226 32.7	116	14 08.8	+113			
3	195 15.8	267 29.6	25.1	170 59.6	22.8	82 42.6	18.2	325 55.8	46.0	241 03.3	117	13 57.5	+113			
4	210 18.3	282 29.0	24.9	186 00.4	23.4	97 45.3	18.2	340 58.3	46.0	255 34.0	117	13 46.2	+114			
5	225 20.7	297 28.5	24.7	201 01.2	24.1	112 47.9	18.3	356 00.7	46.0	270 04.7	117	13 34.8	+115			
6	240 23.2	312 27.9	-20 24.6	216 02.0	+10 24.8	127 50.6	+22 18.3	11 03.1	-15 46.0	284 35.4	118	-13 23.3	+116			
7	255 25.7	327 27.4	24.4	231 02.8	25.5	142 53.3	18.3	26 05.6	46.0	299 06.2	117	13 11.7	+116			
8	270 28.1	342 26.8	24.2	246 03.6	26.1	157 55.9	18.4	41 08.0	46.0	313 36.9	118	13 00.1	+118			
9	285 30.6	357 26.3	24.1	261 04.4	26.8	172 58.6	18.4	56 10.4	46.0	328 07.7	118	12 48.3	+117			
10	300 33.1	12 25.8	23.9	276 05.2	27.5	188 01.2	18.4	71 12.8	46.0	342 38.5	118	12 36.6	+119			
11	315 35.5	27 25.2	23.7	291 06.0	28.1	203 03.9	18.5	86 15.3	46.0	357 09.3	118	12 24.7	+120			
12	330 38.0	42 24.7	-20 23.5	306 06.9	+10 28.8	218 06.6	+22 18.5	101 17.7	-15 46.0	11 40.1	118	-12 12.7	+120			
13	345 40.5	57 24.1	23.4	321 07.7	29.5	233 09.2	18.5	116 20.1	46.0	26 10.9	119	12 00.7	+121			
14	0 42.9	72 23.6	23.2	336 08.5	30.1	248 11.9	18.6	131 22.5	46.0	40 41.8	118	11 48.6	+121			
15	15 45.4	87 23.0	23.0	351 09.3	30.8	263 14.6	18.6	146 25.0	46.0	55 12.6	119	11 36.5	+122			
16	30 47.8	102 22.5	22.8	6 10.1	31.5	278 17.2	18.6	161 27.4	46.0	69 43.5	119	11 24.3	+123			
17	45 50.3	117 22.0	22.7	21 10.9	32.1	293 19.9	18.6	176 29.8	46.0	84 14.4	119	11 12.0	+124			
18	60 52.8	132 21.4	-20 22.5	36 11.7	+10 32.8	308 22.5	+22 18.7	191 32.3	-15 46.0	98 45.3	119	-10 59.6	+124			
19	75 55.2	147 20.9	22.3	51 12.5	33.5	323 25.2	18.7	206 34.7	46.0	113 16.2	120	10 47.2	+125			
20	90 57.7	162 20.3	22.1	66 13.3	34.1	338 27.8	18.7	221 37.1	46.0	127 47.2	119	10 34.7	+126			
21	106 00.2	177 19.8	21.9	81 14.1	34.8	353 30.5	18.8	236 39.6	46.0	142 18.1	120	10 22.1	+126			
22	121 02.6	192 19.2	21.8	96 14.9	35.5	8 33.2	18.8	251 42.0	46.0	156 49.1	119	10 09.5	+127			
23	136 05.1	207 18.7	21.6	111 15.7	36.1	23 35.8	18.8	266 44.4	46.0	171 20.0	120	9 56.8	+127			
22 0	151 07.6	222 18.1	-20 21.4	126 16.6	+10 36.8	38 38.5	+22 18.9	281 46.8	-15 46.0	185 51.0	120	- 9 44.1	+128			
1	166 10.0	237 17.6	21.2	141 17.4	37.5	53 41.1	18.9	296 49.3	46.0	200 22.0	120	9 31.3	+129			
2	181 12.5	252 17.0	21.0	156 18.2	38.1	68 43.8	18.9	311 51.7	46.0	214 53.0	120	9 18.4	+129			
3	196 14.9	267 16.5	20.8	171 19.0	38.8	83 46.4	18.9	326 54.1	46.0	229 24.0	120	9 05.5	+130			
4	211 17.4	282 16.0	20.7	186 19.8	39.4	98 49.1	19.0	341 56.6	46.0	243 55.0	120	8 52.5	+130			
5	226 19.9	297 15.4	20.5	201 20.6	40.1	113 51.8	19.0	356 59.0	46.0	258 26.0	121	8 39.5	+131			
6	241 22.3	312 14.9	-20 20.3	216 21.4	+10 40.8	128 54.4	+22 19.0	12 01.4	-15 46.0	272 57.1	120	- 8 26.4	+131			
7	256 24.8	327 14.3	20.1	231 22.2	41.4	143 57.1	19.1	27 03.9	46.0	287 28.1	120	8 13.3	+132			
8	271 27.3	342 13.8	19.9	246 23.0	42.1	158 59.7	19.1	42 06.3	46.0	301 59.1	121	8 00.1	+132			
9	286 29.7	357 13.2	19.7	261 23.8	42.8	174 02.4	19.1	57 08.7	46.0	316 30.2	120	7 46.9	+133			
10	301 32.2	12 12.7	19.5	276 24.6	43.4	189 05.0	19.1	72 11.2	46.0	331 01.2	121	7 33.6	+134			
11	316 34.7	27 12.1	19.3	291 25.4	44.1	204 07.7	19.2	87 13.6	46.0	345 32.3	120	7 20.2	+133			
12	331 37.1	42 11.6	-20 19.1	306 26.2	+10 44.8	219 10.3	+22 19.2	102 16.0	-15 46.0	0 03.3	121	- 7 06.9	+135			
13	346 39.6	57 11.0	18.9	321 27.1	45.4	234 13.0	19.2	117 18.5	46.0	14 34.4	121	6 53.4	+135			
14	1 42.1	72 10.5	18.7	336 27.9	46.1	249 15.6	19.3	132 20.9	46.0	29 05.5	120	6 39.9	+135			
15	16 44.5	87 09.9	18.5	351 28.7	46.7	264 18.3	19.3	147 23.3	46.0	43 36.5	121	6 26.4	+136			
16	31 47.0	102 09.4	18.3	6 29.5	47.4	279 20.9	19.3	162 25.7	46.0	58 07.6	121	6 12.8	+136			
17	46 49.4	117 08.8	18.1	21 30.3	48.1	294 23.6	19.4	177 28.2	46.0	72 38.7	120	5 59.2	+136			
18	61 51.9	132 08.3	-20 17.9	36 31.1	+10 48.7	309 26.3	+22 19.4	192 30.6	-15 46.0	87 09.7	121	- 5 45.6	+137			
19	76 54.4	147 07.7	17.7	51 31.9	49.4	324 28.9	19.4	207 33.1	46.0	101 40.8	121	5 31.9	+137			
20	91 56.8	162 07.2	17.5	66 32.7	50.1	339 31.6	19.4	222 35.5	46.0	116 11.9	120	5 18.2	+138			
21	106 59.3	177 06.7	17.3	81 33.5	50.7	354 34.2	19.5	237 37.9	46.0	130 42.9	121	5 04.4	+138			
22	122 01.8	192 06.1	17.1	96 34.3	51.4	9 36.9	19.5	252 40.4	46.0	145 14.0	120	4 50.6	+138			
23	137 04.2	207 05.6	16.9	111 35.1	52.0	24 39.5	19.5	267 42.8	45.9	159 45.0	121	4 36.8	+139			
23 0	152 06.7	222 05.0	-20 16.7	126 35.9	+10 52.7	39 42.2	+22 19.6	282 45.2	-15 45.9	174 16.1	120	- 4 22.9	+139			
1	167 09.2	237 04.5	16.5	141 36.7	53.4	54 44.8	19.6	297 47.7	45.9	188 47.1	121	4 09.0	+139			
2	182 11.6	252 03.9	16.3	156 37.5	54.0	69 47.5	19.6	312 50.1	45.9	203 18.2	120	3 55.1	+140			
3	197 14.1	267 03.4	16.1	171 38.3	54.7	84 50.1	19.6	327 52.5	45.9	217 49.2	120	3 41.1	+140			
4	212 16.6	282 02.8	15.9	186 39.1	55.4	99 52.7	19.7	342 55.0	45.9	232 20.2	120	3 27.1	+140			
5	227 19.0	297 02.3	15.7	201 40.0	56.0	114 55.4	19.7	357 57.4	45.9	246 51.2	120	3 13.1	+141			
6	242 21.5	312 01.7	-20 15.5	216 40.8	+10 56.7	129 58.0	+22 19.7	12 59.8	-15 45.9	261 22.2	120	- 2 59.0	+140			
7	257 23.9	327 01.2	15.2	231 41.6	57.3	145 00.7	19.8	28 02.3	45.9	275 53.2	120	2 45.0	+141			
8	272 26.4	342 00.6	15.0	246 42.4	58.0	160 03.3	19.8	43 04.7	45.9	290 24.2	120	2 30.9	+142			
9	287 28.9	357 00.1	14.8	261 43.2	58.7	175 06.0	19.8	58 07.1	45.9	304 55.2	119	2 16.7	+141			
10	302 31.3	11 59.5	14.6	276 44.0	59.3	190 08.6	19.8	73 09.6	45.9	319 26.1	119	2 02.6	+142			
11	317 33.8	26 59.0	14.4	291 44.8	60.0	205 11.3	19.9	88 12.0	45.9	333 57.0	120	1 48.4	+141			
12	332 36.3	41 58.4	-20 14.2	306 45.6	+11 00.6	220 13.9	+22 19.9	103 14.5	-15 45.9	348 28.0	119	- 1 34.3	+142			
13	347 38.7	56 57.9	13.9	321 46.4	01.3	235 16.6	19.9	118 16.9	45.9	2 58.9	119	1 20.1	+142			
14	2 41.2	71 57.3	13.7	336 47.2	01.9	250 19.2	20.0	133 19.3	45.9	17 29.8	119	1 05.9	+143			
15	17 43.7	86 56.8	13.5	351 48.0	02.6	265 21.9	20.0	148 21.8	45.9	32 00.7	118	0 51.6	+142			
16	32 46.1	101 56.2	13.3	6 48.8	03.3	280 24.5	20.0	163 24.2	45.9	46 31.5	119	0 37.4	+143			
17	47 48.6	116 55.7	13.1	21 49.6	03.9	295 27.1	20.0	178 26.6	45.9	61 02.4	118	0 23.1	+142			
18	62 51.0	131 55.1	-20 12.8	36 50.4	+11 04.6	310 29.8	+22 20.1	193 29.1	-15 45.9	75 33.2	118	- 0 08.9	+143			
19	77 53.5	146 54.6	12.6	51 51.2	05.2	325 32.4	20.1	208 31.5	45.9	90 04.0	118	+ 0 05.4	+143			
20	92 56.0	161 54.0	12.4	66 52.0	05.9	340										

G M T	SUN		STARS				Lat.	Sunrise	Twit. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS						
	GHA	Dec.	No.	Name	SHA	Dec.				21	22	23	24							
														Alt.	Sun's Lower Limb	Venus	Mars			
h	°	'				°	h	m	h	m	h	m	h	m	°	'	'	'		
21	0	176 32.5	-10 54.9	7	Acamar	315 51.5	-40 29.2	72	8 18	4 31	8 09	7 37	7 12	6 49	Alt.					
	1	191 32.5	54.0	5	Achernar	335 59.4	-57 28.0	70	8 04	4 39	7 45	7 25	7 08	6 53	°	'	'	'		
	2	206 32.6	53.1	30	Acrux	173 57.8	-62 51.1	68	7 52	4 47	7 27	7 15	7 05	6 56	Add	Add	Add	Add		
	3	221 32.7	52.2	19	Adhara	255 46.6	-28 54.8	66	7 42	4 53	7 12	7 07	7 03	6 58	0	'	'	'		
	4	236 32.7	51.3	10	Aldebaran	291 39.5	+16 25.3	64	7 34	4 57	7 00	7 00	7 00	7 00	30	0.5	0.2	0.1		
	5	251 32.8	50.4					62	7 27	5 01	6 49	6 54	6 58	7 02	45	0.5	0.1	0.1		
	6	266 32.9	-10 49.5	32	Alioth	166 58.4	+56 11.8	60	7 21	5 04	6 40	6 49	6 57	7 04	60	0.5	0.1	0.0		
	7	281 32.9	48.6	34	Alkaid	153 32.9	+49 31.8	58	7 15	5 06	6 33	6 45	6 55	7 06	75	0.5	0.1	0.0		
	8	296 33.0	47.7	55	Al Na'ir	28 38.9	-47 10.7	56	7 11	5 08	6 26	6 40	6 54	7 07	90	0.5	0.0	0.0		
	9	311 33.1	46.8	15	Alnilam	276 30.6	-1 13.8	54	7 06	5 11	6 19	6 37	6 53	7 08						
	10	326 33.2	45.9	25	Alphard	218 38.7	-8 28.0	52	7 02	5 12	6 14	6 33	6 51	7 09						
	11	341 33.2	45.0					50	6 59	5 13	6 09	6 30	6 51	7 10	Moon's Lower Limb					
	12	356 33.3	-10 44.1	41	Alphecca	126 47.9	+26 51.5	45	6 51	5 15	5 57	6 23	6 48	7 12	Add					
	13	11 33.4	43.2	1	Alpheratz	358 29.1	+28 50.7	40	6 45	5 16	5 48	6 18	6 46	7 14	Alt.	21	22	23		
	14	26 33.4	42.3	51	Altair	62 51.1	+8 44.8	35	6 39	5 15	5 40	6 13	6 45	7 16	°	'	'	'		
	15	41 33.5	41.3	2	Ankaa	353 59.0	-42 33.1	30	6 34	5 15	5 33	6 09	6 43	7 18	0	15.8	16.6	17.3		
	16	56 33.6	40.4	42	Antares	113 19.9	-26 20.1	20	6 25	5 12	5 21	6 01	6 41	7 20	4	15.8	16.6	17.3		
	17	71 33.6	39.5					10	6 18	5 07	5 10	5 55	6 38	7 22	8	15.8	16.6	17.3		
	18	86 33.7	-10 38.6	37	Arcturus	146 35.4	+19 24.6	0	6 10	5 00	5 00	5 48	6 36	7 25	12	15.8	16.5	17.3		
	19	101 33.8	37.7	43	Atria	109 01.1	-68 56.7	10	6 03	4 52	4 50	5 42	6 34	7 27	16	15.8	16.5	17.3		
	20	116 33.9	36.8	22	Avior	234 35.4	-59 22.1	20	5 55	4 38	4 39	5 35	6 32	7 29	20	15.8	16.5	17.3		
	21	131 33.9	35.9	13	Bellatrix	279 18.8	+6 18.6	30	5 45	4 20	4 27	5 28	6 30	7 32	24	15.8	16.5	17.2		
	22	146 34.0	35.0	16	Betelge'se	271 48.4	+7 24.0	35	5 40	4 09	4 20	5 23	6 28	7 34	28	15.8	16.5	17.2		
	23	161 34.1	34.1					40	5 34	3 54	4 11	5 18	6 26	7 36	32	15.8	16.5	17.1		
				17	Canopus	264 15.3	-52 40.5	45	5 26	3 36	4 02	5 13	6 25	7 38	36	15.8	16.4	17.1		
				12	Capella	281 38.9	+45 57.5	50	5 17	3 11	3 50	5 06	6 22	7 40	40	15.8	16.4	17.0		
				53	Deneb	50 01.7	+45 07.1	52	5 13	2 58	3 45	5 02	6 21	7 42	44	15.8	16.4	17.0		
				28	Denebola	183 17.8	+14 49.1	54	5 09	2 43	3 39	4 59	6 20	7 43	48	15.7	16.3	16.9		
				4	Diphda	349 39.9	-18 14.0	56	5 04	2 25	3 32	4 55	6 19	7 44	52	15.7	16.3	16.8		
								58	4 58	2 00	3 24	4 50	6 17	7 46	56	15.7	16.2	16.8		
				27	Dubhe	194 44.3	+61 59.4	60	4 52	1 23	3 16	4 45	6 16	7 48	60	15.7	16.2	16.7		
				14	Elnath	279 07.7	+28 34.4	Lat.		Sunset		Twit. ends		Moonset		64	15.7	16.1	16.6	
				47	Eltanin	91 06.7	+51 29.3	N	h	m	h	m	h	m	h	m	68	15.7	16.1	16.5
				54	Enif	34 30.3	+9 40.1										72	15.7	16.0	16.3
				56	Fomalhaut	16 12.4	-29 51.7	72	16 11	20 03	14 38	16 52	18 59	21 09	76	15.6	15.9	16.2		
				31	Gacrux	172 49.3	-56 51.8	70	16 25	19 53	15 00	17 01	18 59	20 59	80	15.6	15.9	16.1		
				29	Gienah	176 37.0	-17 17.8	68	16 37	19 46	15 17	17 08	18 59	20 52	84	15.6	15.8	16.0		
				35	Hadar	149 49.7	-60 09.4	66	16 47	19 40	15 30	17 15	18 59	20 46	88	15.6	15.8	16.0		
				6	Hamal	328 50.3	+23 15.2	64	16 55	19 35	15 41	17 20	18 59	20 40	90	Add to table, back cover				
				48	Kaus Aust.	84 41.9	-34 24.4	62	17 02	19 31	15 50	17 24	18 59	20 36	Moon's Upper Limb					
				40	Kochab	137 17.4	+74 19.9	60	17 08	19 28	15 58	17 28	18 59	20 32	Subtract					
				57	Markab	14 22.2	+14 57.8	58	17 13	19 24	16 05	17 32	18 59	20 28	Alt.	21	22	23		
				8	Menkar	315 00.8	+3 54.9	56	17 18	19 22	16 11	17 35	18 59	20 25	°	'	'	'		
				36	Menkent	148 59.0	-36 09.1	54	17 22	19 20	16 17	17 37	18 59	20 23	0	15.4	15.0	14.5		
				24	Miapl'dus	221 48.3	-69 32.1	52	17 26	19 19	16 21	17 40	18 59	20 20	4	15.4	15.0	14.5		
								50	17 29	19 17	16 26	17 42	18 59	20 18	8	15.4	15.0	14.5		
				9	Mirfak	309 43.1	+49 42.4	45	17 37	19 15	16 35	17 47	18 59	20 13	12	15.4	15.0	14.6		
				50	Nunki	76 52.6	-26 21.2	40	17 43	19 13	16 43	17 51	18 59	20 09	16	15.4	15.0	14.6		
				52	Peacock	54 28.4	-56 52.7	35	17 49	19 14	16 50	17 54	18 59	20 05	20	15.4	15.0	14.6		
				21	Pollux	244 20.8	+28 08.1	30	17 54	19 14	16 56	17 57	18 59	20 02	24	15.4	15.0	14.6		
				20	Procyon	245 45.2	+5 20.3	20	18 02	19 16	17 06	18 02	18 59	19 57	28	15.4	15.0	14.7		
								10	18 10	19 21	17 15	18 07	18 59	19 52	32	15.4	15.1	14.7		
				46	R'alhague	96 47.1	+12 35.3	0	18 17	19 27	17 23	18 11	18 59	19 48	36	15.4	15.1	14.8		
				26	Regulus	208 29.6	+12 11.0	10	18 24	19 35	17 31	18 15	18 59	19 44	40	15.4	15.1	14.8		
				11	Rigel	281 53.9	-8 15.2	20	18 32	19 48	17 40	18 20	18 59	19 39	44	15.5	15.2	14.9		
				38	Rigel Kent.	140 51.3	-60 39.0	30	18 42	20 05	17 50	18 25	18 59	19 34	48	15.5	15.2	15.0		
				44	Sabik	103 02.7	-15 40.3	35	18 47	20 16	17 55	18 28	18 59	19 31	52	15.5	15.2	15.0		
								40	18 53	20 30	18 02	18 31	18 59	19 27	56	15.5	15.3	15.0		
				3	Schedar	350 31.0	+56 17.7	45	19 00	20 48	18 09	18 34	18 59	19 23	60	15.5	15.3	15.1		
				45	Shaula	97 21.4	-37 04.3	50	19 09	21 13	18 18	18 39	18 58	19 19	64	15.5	15.3	15.2		
				18	Sirius	259 12.0	-16 39.4	52	19 13	21 25	18 22	18 41	18 58	19 16	68	15.5	15.4	15.3		
				33	Spica	159 17.1	-10 55.9	54	19 17	21 39	18 26	18 43	18 58	19 14	72	15.5	15.5	15.5		
				23	Suhail	223 24.2	-43 15.3	56	19 22	21 58	18 31	18 45	18 58	19 11	76	15.6	15.5	15.5		
								58	19 28	22 21	18 37	18 48	18 58	19 09	80	15.6	15.6	15.6		
				49	Vega	81 08.8	+38 44.2	60	19 34	22 55	18 43	18 51	18 58	19 05	84	15.6	15.7	15.7		
				39	Zub'g'bi	137 53.7	-15 51.5	G M T		Equation of Time (App.—Mean)		GMT of Transit		Meridian of Greenwich		88	15.6	15.7	15.8	
								h	m	s	h	m	s	h	m	88	15.6	15.7	15.8	
								21	11 12	9 10	15 35	21 26	5 16	Subtract from table, back cover						
								22	12 00	9 11	15 34	21 22	5 12	Washington's Birthday 22						
								23	12 48	9 12	15 33	21 17	5 08	New Moon 22						
								24	13 36	9 13	15 32	21 13	5 04	Ash Wednesday 23						
code																				

G M T	VENUS — 3.8		MARS 1.4		JUPITER — 2.1		SATURN 0.7		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
h	o	°	o	°	o	°	o	°	o	°	o	°
24	0	153 05.8	221 51.8	-20 11.5	126 55.2	+11 08.5	40 45.6	+22 20.2	283 43.7	-15 45.9	162 37.7	117 + 1 16.9 +143
	1	168 08.3	236 51.2	11.2	141 56.0	09.2	55 48.3	20.3	298 46.1	45.9	177 08.4	116 1 31.2 +143
	2	183 10.8	251 50.7	11.0	156 56.9	09.8	70 50.9	20.3	313 48.6	45.9	191 39.0	116 1 45.5 +143
	3	198 13.2	266 50.1	.. 10.8	171 57.7	.. 10.5	85 53.6	.. 20.3	328 51.0	.. 45.9	206 09.6	116 1 59.8 +143
	4	213 15.7	281 49.6	10.6	186 58.5	11.2	100 56.2	20.3	343 53.5	45.9	220 40.2	116 2 14.1 +143
	5	228 18.2	296 49.0	10.3	201 59.3	11.8	115 58.8	20.4	358 55.9	45.9	235 10.8	115 2 28.4 +143
	6	243 20.6	311 48.5	-20 10.1	217 00.1	+11 12.5	131 01.5	+22 20.4	13 58.3	-15 45.9	249 41.3	115 + 2 42.7 +143
	7	258 23.1	326 47.9	09.9	232 00.9	13.1	146 04.1	20.4	29 00.8	45.9	264 11.8	114 2 57.0 +142
	8	273 25.5	341 47.4	09.6	247 01.7	13.8	161 06.8	20.4	44 03.2	45.9	278 42.2	115 3 11.2 +143
	9	288 28.0	356 46.8	.. 09.4	262 02.5	.. 14.4	176 09.4	.. 20.5	59 05.7	.. 45.9	293 12.7	114 3 25.5 +143
10	0	303 30.5	11 46.3	09.1	277 03.3	15.1	191 12.0	20.5	74 08.1	45.9	307 43.1	114 3 39.8 +142
	11	318 32.9	26 45.7	08.9	292 04.1	15.7	206 14.7	20.5	89 10.5	45.9	322 13.5	113 3 54.0 +142
	12	333 35.4	41 45.2	-20 08.7	307 04.9	+11 16.4	221 17.3	+22 20.6	104 13.0	-15 45.9	336 43.8	113 + 4 08.2 +142
	13	348 37.9	56 44.6	08.4	322 05.7	17.1	236 19.9	20.6	119 15.4	45.9	351 14.1	113 4 22.4 +142
	14	3 40.3	71 44.1	08.2	337 06.5	17.7	251 22.6	20.6	134 17.9	45.9	5 44.4	112 4 36.6 +142
	15	18 42.8	86 43.5	.. 07.9	352 07.3	.. 18.4	266 25.2	.. 20.6	149 20.3	.. 45.9	20 14.6	112 4 50.8 +142
	16	33 45.3	101 43.0	07.7	7 08.1	19.0	281 27.9	20.7	164 22.8	45.8	34 44.8	111 5 05.0 +141
	17	48 47.7	116 42.4	07.4	22 08.9	19.7	296 30.5	20.7	179 25.2	45.8	49 14.9	111 5 19.1 +141
	18	63 50.2	131 41.8	-20 07.2	37 09.7	+11 20.3	311 33.1	+22 20.7	194 27.6	-15 45.8	63 45.0	111 + 5 33.2 +141
	19	78 52.6	146 41.3	07.0	52 10.5	21.0	326 35.8	20.7	209 30.1	45.8	78 15.1	110 5 47.3 +141
	20	93 55.1	161 40.7	06.7	67 11.3	21.6	341 38.4	20.8	224 32.5	45.8	92 45.1	110 6 01.4 +141
	21	108 57.6	176 40.2	.. 06.5	82 12.1	.. 22.3	356 41.0	.. 20.8	239 35.0	.. 45.8	107 15.1	110 6 15.5 +140
	22	124 00.0	191 39.6	06.2	97 12.9	22.9	11 43.7	20.8	254 37.4	45.8	121 45.1	109 6 29.5 +140
	23	139 02.5	206 39.1	06.0	112 13.7	23.6	26 46.3	20.8	269 39.9	45.8	136 15.0	108 6 43.5 +139
25	0	154 05.0	221 38.5	-20 05.7	127 14.5	+11 24.2	41 48.9	+22 20.9	284 42.3	-15 45.8	150 44.8	109 + 6 57.4 +139
	1	169 07.4	236 38.0	05.5	142 15.3	24.9	56 51.6	20.9	299 44.7	45.8	165 14.7	107 7 11.3 +139
	2	184 09.9	251 37.4	05.2	157 16.1	25.5	71 54.2	20.9	314 47.2	45.8	179 44.4	107 7 25.2 +139
	3	199 12.4	266 36.9	.. 04.9	172 16.9	.. 26.2	86 56.8	.. 20.9	329 49.6	.. 45.8	194 14.1	107 7 39.1 +138
	4	214 14.8	281 36.3	04.7	187 17.7	26.8	101 59.5	21.0	344 52.1	45.8	208 43.8	106 7 52.9 +138
	5	229 17.3	296 35.8	04.4	202 18.5	27.5	117 02.1	21.0	359 54.5	45.8	223 13.4	106 8 06.7 +137
	6	244 19.8	311 35.2	-20 04.2	217 19.3	+11 28.2	132 04.7	+22 21.0	14 57.0	-15 45.8	237 43.0	106 + 8 20.4 +137
	7	259 22.2	326 34.6	03.9	232 20.1	28.8	147 07.4	21.1	29 59.4	45.8	252 12.6	104 8 34.1 +137
	8	274 24.7	341 34.1	03.7	247 20.9	29.5	162 10.0	21.1	45 01.8	45.8	266 42.0	105 8 47.8 +136
	9	289 27.1	356 33.5	.. 03.4	262 21.7	.. 30.1	177 12.6	.. 21.1	60 04.3	.. 45.8	281 11.5	103 9 01.4 +136
10	0	304 29.6	11 33.0	03.1	277 22.5	30.8	192 15.3	21.1	75 06.7	45.8	295 40.8	104 9 15.0 +135
	11	319 32.1	26 32.4	02.9	292 23.3	31.4	207 17.9	21.2	90 09.2	45.8	310 10.2	102 9 28.5 +135
	12	334 34.5	41 31.9	-20 02.6	307 24.1	+11 32.1	222 20.5	+22 21.2	105 11.6	-15 45.8	324 39.4	102 + 9 42.0 +134
	13	349 37.0	56 31.3	02.3	322 24.9	32.7	237 23.1	21.2	120 14.1	45.8	339 08.6	102 9 55.4 +134
	14	4 39.5	71 30.8	02.1	337 25.7	33.4	252 25.8	21.2	135 16.5	45.8	353 37.8	101 10 08.8 +133
	15	19 41.9	86 30.2	.. 01.8	352 26.5	.. 34.0	267 28.4	.. 21.3	150 19.0	.. 45.8	8 06.9	101 10 22.1 +132
	16	34 44.4	101 29.7	01.5	7 27.3	34.7	282 31.0	21.3	165 21.4	45.8	22 36.0	99 10 35.3 +133
	17	49 46.9	116 29.1	01.3	22 28.1	35.3	297 33.6	21.3	180 23.9	45.7	37 04.9	100 10 48.6 +131
	18	64 49.3	131 28.5	-20 01.0	37 28.9	+11 36.0	312 36.3	+22 21.3	195 26.3	-15 45.7	51 33.9	99 +11 01.7 +131
	19	79 51.8	146 28.0	00.7	52 29.7	36.6	327 38.9	21.4	210 28.8	45.7	66 02.8	98 11 14.8 +130
	20	94 54.3	161 27.4	00.5	67 30.5	37.3	342 41.5	21.4	225 31.2	45.7	80 31.6	97 11 27.8 +130
	21	109 56.7	176 26.9	-20 00.2	82 31.3	.. 37.9	357 44.2	.. 21.4	240 33.6	.. 45.7	95 00.3	97 11 40.8 +129
	22	124 59.2	191 26.3	19 59.9	97 32.1	38.6	12 46.8	21.4	255 36.1	45.7	109 29.0	97 11 53.7 +128
	23	140 01.6	206 25.8	59.7	112 32.9	39.2	27 49.4	21.5	270 38.5	45.7	123 57.7	96 12 06.5 +128
26	0	155 04.1	221 25.2	-19 59.4	127 33.7	+11 39.9	42 52.0	+22 21.5	285 41.0	-15 45.7	138 26.3	95 +12 19.3 +127
	1	170 06.6	236 24.7	59.1	142 34.5	40.5	57 54.7	21.5	300 43.4	45.7	152 54.8	94 12 32.0 +127
	2	185 09.0	251 24.1	58.8	157 35.3	41.1	72 57.3	21.5	315 45.9	45.7	167 23.2	94 12 44.7 +125
	3	200 11.5	266 23.5	.. 58.6	172 36.1	.. 41.8	87 59.9	.. 21.6	330 48.3	.. 45.7	181 51.6	94 12 57.2 +125
	4	215 14.0	281 23.0	58.3	187 36.9	42.4	103 02.5	21.6	345 50.8	45.7	196 20.0	92 13 09.7 +125
	5	230 16.4	296 22.4	58.0	202 37.7	43.1	118 05.2	21.6	0 53.2	45.7	210 48.2	92 13 22.2 +123
	6	245 18.9	311 21.9	-19 57.7	217 38.5	+11 43.7	133 07.8	+22 21.6	15 55.7	-15 45.7	225 16.4	92 +13 34.5 +123
	7	260 21.4	326 21.3	57.4	232 39.3	44.4	148 10.4	21.7	30 58.1	45.7	239 44.6	91 13 46.8 +122
	8	275 23.8	341 20.8	57.2	247 40.1	45.0	163 13.0	21.7	46 00.6	45.7	254 12.7	90 13 59.0 +121
	9	290 26.3	356 20.2	.. 56.9	262 40.9	.. 45.7	178 15.6	.. 21.7	61 03.0	.. 45.7	268 40.7	89 14 11.1 +120
10	0	305 28.7	11 19.6	56.6	277 41.7	46.3	193 18.3	21.7	76 05.5	45.7	283 08.6	89 14 23.1 +120
	11	320 31.2	26 19.1	56.3	292 42.5	47.0	208 20.9	21.7	91 07.9	45.7	297 36.5	88 14 35.1 +118
	12	335 33.7	41 18.5	-19 56.0	307 43.3	+11 47.6	223 23.5	+22 21.8	106 10.4	-15 45.7	312 04.3	88 +14 46.9 +118
	13	350 36.1	56 18.0	55.7	322 44.1	48.3	238 26.1	21.8	121 12.8	45.7	326 32.1	86 14 58.7 +117
	14	5 38.6	71 17.4	55.4	337 44.9	48.9	253 28.8	21.8	136 15.3	45.6	340 59.7	87 15 10.4 +116
	15	20 41.1	86 16.9	.. 55.2	352 45.7	.. 49.6	268 31.4	.. 21.8	151 17.7	.. 45.6	355 27.4	85 15 22.0 +115
	16	35 43.5	101 16.3	54.9	7 46.5	50.2	283 34.0	21.9	166 20.2	45.6	9 54.9	85 15 33.5 +115
	17	50 46.0	116 15.8	54.6	22 47.3	50.8	298 36.6	21.9	181 22.6	45.6	24 22.4	84 15 45.0 +113
	18	65 48.5	131 15.2	-19 54.3	37 48.1	+11 51.5	313 39.2	+22 21.9	196 25.1	-15 45.6	38 49.8	83 +15 56.3 +112
	19	80 50.9	146 14.6	54.0	52 48.9	52.1	328 41.9	21.9	211 27.5	45.6	53 17.1	83 16 07.5 +112
	20	95 53.4	161 14.1	53.7	67 49.7	52.8	343 44.5	22.0	226 30.0	45.6	67 44.4	82 16 18.7 +110
	21	110 55.9	176 13.5	.. 53.4	82 50.5	.. 53.4	358 47.1	.. 22.0	241 32.4	.. 45.6	82 11.6	82 16 29.7 +110
	22	125 58.3	191 13.0	53.1	97 51.3	54.1	13 49.7	22.0	256 34.9	45.6	96 38.8	80 16 40.7 +108
	23	141 00.8	206 12.4	52.8	112 52.1	54.7	28 52.3	22.0	271 37.3	45.6	111 05.8	81 16 51.5 +108
24		156 03.2	221 11.9	-19 52.5	127 52.9	+11 55.4	43 54.9	+22 22.1	286 39.8	-15 45.6	125 32.9	79 +17 02.3 +106
code		—	- 6	+ 3	+ 8	+ 6	+ 26	0	+ 25	0		

G M T	VENUS — 3.8		MARS 1.4		JUPITER — 2.0		SATURN 0.6		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
h	o	o	o	o	o	o	o	o	o	o	o	o
27	0	156 03.2	221 11.9	-19 52.5	127 52.9	+11 55.4	43 54.9	+22 22.1	286 39.8	-15 45.6	125 32.9	79 +17 02.3 +106
1	171 05.7	236 11.3	52.2	142 53.7	56.0	58 57.6	22.1	301 42.2	45.6	139 59.8	79 17 12.9 +105	
2	186 08.2	251 10.7	51.9	157 54.5	56.6	74 00.2	22.1	316 44.7	45.6	154 26.7	78 17 23.4 +105	
3	201 10.6	266 10.2	.. 51.6	172 55.3	.. 57.3	89 02.8	.. 22.1	331 47.1	.. 45.6	168 53.5	77 -17 33.9 +103	
4	216 13.1	281 09.6	51.3	187 56.1	57.9	104 05.4	22.2	346 49.6	45.6	183 20.2	77 17 44.2 +102	
5	231 15.6	296 09.1	51.0	202 56.9	58.6	119 08.0	22.2	1 52.0	45.6	197 46.9	75 17 54.4 +101	
6	246 18.0	311 08.5	-19 50.7	217 57.7	+11 59.2	134 10.6	+22 22.2	16 54.5	-15 45.6	212 13.4	76 +18 04.5 +100	
7	261 20.5	326 08.0	50.4	232 58.5	11 59.9	149 13.2	22.2	31 57.0	45.5	226 40.0	74 18 14.5 + 99	
8	276 23.0	341 07.4	50.1	247 59.3	12 00.5	164 15.9	22.2	46 59.4	45.5	241 06.4	74 18 24.4 + 98	
9	291 25.4	356 06.8	.. 49.8	263 00.1	.. 01.1	179 18.5	.. 22.3	62 01.9	.. 45.5	255 32.8	74 -18 34.2 + 96	
10	306 27.9	11 06.3	49.5	278 00.9	01.8	194 21.1	22.3	77 04.3	45.5	269 59.2	72 18 43.8 + 96	
11	321 30.4	26 05.7	49.2	293 01.7	02.4	209 23.7	22.3	92 06.8	45.5	284 25.4	72 18 53.4 + 94	
12	336 32.8	41 05.2	-19 48.9	308 02.5	+12 03.1	224 26.3	+22 22.3	107 09.2	-15 45.5	298 51.6	71 +19 02.8 + 93	
13	351 35.3	56 04.6	48.6	323 03.3	03.7	239 28.9	22.4	122 11.7	45.5	313 17.7	71 19 12.1 + 92	
14	6 37.7	71 04.1	48.3	338 04.1	04.3	254 31.5	22.4	137 14.1	45.5	327 43.8	70 19 21.3 + 90	
15	21 40.2	86 03.5	.. 47.9	353 04.9	.. 05.0	269 34.2	.. 22.4	152 16.6	.. 45.5	342 09.8	69 -19 30.3 + 90	
16	36 42.7	101 02.9	47.6	8 05.7	05.6	284 36.8	22.4	167 19.0	45.5	356 35.7	69 19 39.3 + 88	
17	51 45.1	116 02.4	47.3	23 06.5	06.3	299 39.4	22.5	182 21.5	45.5	11 01.6	68 19 48.1 + 87	
18	66 47.6	131 01.8	-19 47.0	38 07.3	+12 06.9	314 42.0	+22 22.5	197 23.9	-15 45.5	25 27.4	67 +19 56.8 + 85	
19	81 50.1	146 01.3	46.7	53 08.1	07.5	329 44.6	22.5	212 26.4	45.5	39 53.1	67 20 05.3 + 85	
20	96 52.5	161 00.7	46.4	68 08.9	08.2	344 47.2	22.5	227 28.9	45.5	54 18.8	66 20 13.8 + 83	
21	111 55.0	176 00.2	.. 46.1	83 09.7	.. 08.8	359 49.8	.. 22.5	242 31.3	.. 45.5	68 44.4	65 -20 22.1 + 81	
22	126 57.5	190 59.6	45.7	98 10.5	09.5	14 52.4	22.6	257 33.8	45.4	83 09.9	65 20 30.2 + 81	
23	141 59.9	205 59.0	45.4	113 11.3	10.1	29 55.0	22.6	272 36.2	45.4	97 35.4	64 20 38.3 + 79	
28	0	157 02.4	220 58.5	-19 45.1	128 12.1	+12 10.7	44 57.6	+22 22.6	287 38.7	-15 45.4	112 00.8	64 +20 46.2 + 78
1	172 04.8	235 57.9	44.8	143 12.9	11.4	60 00.3	22.6	302 41.1	45.4	126 26.2	63 20 54.0 + 76	
2	187 07.3	250 57.4	44.5	158 13.7	12.0	75 02.9	22.7	317 43.6	45.4	140 51.5	63 21 01.6 + 75	
3	202 09.8	265 56.8	.. 44.1	173 14.4	.. 12.7	90 05.5	.. 22.7	332 46.1	.. 45.4	155 16.8	62 -21 09.1 + 74	
4	217 12.2	280 56.3	43.8	188 15.2	13.3	105 08.1	22.7	347 48.5	45.4	169 42.0	61 21 16.5 + 72	
5	232 14.7	295 55.7	43.5	203 16.0	13.9	120 10.7	22.7	2 51.0	45.4	184 07.1	61 21 23.7 + 71	
6	247 17.2	310 55.1	-19 43.2	218 16.8	+12 14.6	135 13.3	+22 22.7	17 53.4	-15 45.4	198 32.2	60 +21 30.8 + 70	
7	262 19.6	325 54.6	42.8	233 17.6	15.2	150 15.9	22.8	32 55.9	45.4	212 57.2	60 21 37.8 + 68	
8	277 22.1	340 54.0	42.5	248 18.4	15.9	165 18.5	22.8	47 58.3	45.4	227 22.2	59 21 44.6 + 67	
9	292 24.6	355 53.5	.. 42.2	263 19.2	.. 16.5	180 21.1	.. 22.8	63 00.8	.. 45.4	241 47.1	58 -21 51.3 + 65	
10	307 27.0	10 52.9	41.9	278 20.0	17.1	195 23.7	22.8	78 03.3	45.4	256 11.9	58 21 57.8 + 64	
11	322 29.5	25 52.4	41.5	293 20.8	17.8	210 26.3	22.8	93 05.7	45.4	270 36.7	58 22 04.2 + 62	
12	337 32.0	40 51.8	-19 41.2	308 21.6	+12 18.4	225 28.9	+22 22.9	108 08.2	-15 45.3	285 01.5	57 +22 10.4 + 61	
13	352 34.4	55 51.2	40.9	323 22.4	19.0	240 31.5	22.9	123 10.6	45.3	299 26.2	57 22 16.5 + 60	
14	7 36.9	70 50.7	40.5	338 23.2	19.7	255 34.1	22.9	138 13.1	45.3	313 50.9	56 22 22.5 + 58	
15	22 39.3	85 50.1	.. 40.2	353 24.0	.. 20.3	270 36.7	.. 22.9	153 15.5	.. 45.3	328 15.5	56 +22 28.3 + 56	
16	37 41.8	100 49.6	39.9	8 24.8	20.9	285 39.3	23.0	168 18.0	45.3	342 40.1	55 22 33.9 + 55	
17	52 44.3	115 49.0	39.5	23 25.6	21.6	300 41.9	23.0	183 20.5	45.3	357 04.6	55 22 39.4 + 54	
18	67 46.7	130 48.5	-19 39.2	38 26.4	+12 22.2	315 44.5	+22 23.0	198 22.9	-15 45.3	11 29.1	54 +22 44.8 + 52	
19	82 49.2	145 47.9	38.8	53 27.2	22.9	330 47.1	23.0	213 25.4	45.3	25 53.5	54 22 50.0 + 50	
20	97 51.7	160 47.3	38.5	68 28.0	23.5	345 49.8	23.0	228 27.8	45.3	40 17.9	54 22 55.0 + 49	
21	112 54.1	175 46.8	.. 38.2	83 28.8	.. 24.1	0 52.4	.. 23.1	243 30.3	.. 45.3	54 42.3	53 +22 59.9 + 47	
22	127 56.6	190 46.2	37.8	98 29.6	24.8	15 55.0	23.1	258 32.8	45.3	69 06.6	53 23 04.6 + 46	
23	142 59.1	205 45.7	37.5	113 30.3	25.4	30 57.6	23.1	273 35.2	45.3	83 30.9	52 23 09.2 + 45	
1	0	158 01.5	220 45.1	-19 37.1	128 31.1	+12 26.0	46 00.2	+22 23.1	288 37.7	-15 45.3	97 55.1	52 +23 13.7 + 43
1	173 04.0	235 44.6	36.8	143 31.9	26.7	61 02.8	23.1	303 40.2	45.2	112 19.3	52 23 18.0 + 41	
2	188 06.5	250 44.0	36.5	158 32.7	27.3	76 05.4	23.2	318 42.6	45.2	126 43.5	52 23 22.1 + 39	
3	203 08.9	265 43.4	.. 36.1	173 33.5	.. 27.9	91 08.0	.. 23.2	333 45.1	.. 45.2	141 07.7	51 +23 26.0 + 39	
4	218 11.4	280 42.9	35.8	188 34.3	28.6	106 10.6	23.2	348 47.5	45.2	155 31.8	51 23 29.9 + 36	
5	233 13.8	295 42.3	35.4	203 35.1	29.2	121 13.2	23.2	3 50.0	45.2	169 55.9	51 23 33.5 + 35	
6	248 16.3	310 41.8	-19 35.1	218 35.9	+12 29.8	136 15.8	+22 23.3	18 52.5	-15 45.2	184 20.0	50 +23 37.0 + 33	
7	263 18.8	325 41.2	34.7	233 36.7	30.5	151 18.3	23.3	33 54.9	45.2	198 44.0	50 23 40.3 + 32	
8	278 21.2	340 40.7	34.4	248 37.5	31.1	166 20.9	23.3	48 57.4	45.2	213 08.0	50 23 43.5 + 31	
9	293 23.7	355 40.1	.. 34.0	263 38.3	.. 31.7	181 23.5	.. 23.3	63 59.8	.. 45.2	227 32.0	50 +23 46.6 + 28	
10	308 26.2	10 39.5	33.7	278 39.1	32.4	196 26.1	23.3	79 02.3	45.2	241 56.0	50 23 49.4 + 27	
11	323 28.6	25 39.0	33.3	293 39.9	33.0	211 28.7	23.4	94 04.8	45.2	256 20.0	49 23 52.1 + 26	
12	338 31.1	40 38.4	-19 33.0	308 40.7	+12 33.6	226 31.3	+22 23.4	109 07.2	-15 45.1	270 43.9	49 +23 54.7 + 23	
13	353 33.6	55 37.9	32.6	323 41.5	34.3	241 33.9	23.4	124 09.7	45.1	285 07.8	50 23 57.0 + 23	
14	8 36.0	70 37.3	32.3	338 42.3	34.9	256 36.5	23.4	139 12.2	45.1	299 31.8	49 23 59.3 + 20	
15	23 38.5	85 36.7	.. 31.9	353 43.1	.. 35.5	271 39.1	.. 23.4	154 14.6	.. 45.1	313 55.7	49 +24 01.3 + 19	
16	38 40.9	100 36.2	31.5	8 43.8	36.2	286 41.7	23.5	169 17.1	45.1	328 19.6	48 24 03.2 + 17	
17	53 43.4	115 35.6	31.2	23 44.6	36.8	301 44.3	23.5	184 19.5	45.1	342 43.4	49 24 04.9 + 16	
18	68 45.9	130 35.1	-19 30.8	38 45.4	+12 37.4	316 46.9	+22 23.5	199 22.0	-15 45.1	357 07.3	49 +24 06.5 + 14	
19	83 48.3	145 34.5	30.5	53 46.2	38.0	331 49.5	23.5	214 24.5	45.1	11 31.2	48 24 07.9 + 13	
20	98 50.8	160 34.0	30.1	68 47.0	38.7	346 52.1	23.5	229 26.9	45.1	25 55.0	49 24 09.2 + 11	
21	113 53.3	175 33.4	.. 29.7	83 47.8	.. 39.3	1 54.7	.. 23.6	244 29.4	.. 45.1	40 18.9	49 +24 10.3 + 9	
22	128 55.7	190 32.8	29.4	98 48.6	39.9	16 57.3	23.6	259 31.9	45.1	54 42.8	48 24 11.2 + 8	
23	143 58.2	205 32.3	29.0	113 49.4	40.6	31 59.9	23.6	274 34.3	45.1	69 06.6	49 24 12.0 + 6	
24	159 00.7	220 31.7	-19 28.6	128 50.2	+12 41.2	47 02.5	+22 23.6	289 36.8	-15 45.0	83 30.5	49 +24 12.6 + 4	
code	-	- 6	+ 3	+ 8	+ 6	+ 26	0	+ 24	0			

G M T	SUN			STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.	No.	Name	SHA	Dec.	27				28	1	2	Alt.	Sun's Low'r Limb	Venus	Mars			
	h ° ' "	° ' "			° ' "	° ' "	N °	h m	h m	h m	h m	h m	h m		°	'	'	'		
27	0	176 44.8	- 8 42.7	7	Acamar	315 51.6	-40 29.2	72	7 46	3 59	4 32	□	□	□	Alt.					
	1	191 45.0	41.8	5	Achernar	335 59.5	-57 28.0	70	7 35	4 12	5 41	□	□	□	°	'	'			
	2	206 45.1	40.9	30	Acrux	173 57.7	-62 51.1	68	7 27	4 23	6 18	5 44	□	□	Add	Add	Add			
	3	221 45.2	39.9	19	Adhara	255 46.6	-28 54.8	66	7 19	4 30	6 45	6 40	6 34	□	°	'	'			
	4	236 45.3	39.0	10	Aldebaran	291 39.5	+16 25.3	64	7 13	4 37	7 05	7 13	7 33	8 22	0	'	'			
	5	251 45.4	38.0					62	7 08	4 42	7 22	7 38	8 07	9 00	30	0.5	0.2			
	6	266 45.5	- 8 37.1	32	Alioth	166 58.4	+56 11.8	60	7 04	4 47	7 36	7 58	8 32	9 27	45	0.5	0.1			
	7	281 45.6	36.2	34	Alkaid	153 32.8	+49 31.8	58	7 00	4 51	7 48	8 14	8 52	9 48	60	0.5	0.1			
	8	296 45.7	35.2	55	Al Na'ir	28 38.9	-47 10.7	56	6 56	4 54	7 59	8 28	9 09	10 05	75	0.5	0.1			
	9	311 45.8	34.3	15	Alnilam	276 30.6	- 1 13.8	54	6 53	4 57	8 08	8 40	9 23	10 20	90	0.5	0.0			
	10	326 45.9	33.4	25	Alphard	218 38.7	- 8 28.0	52	6 50	5 00	8 16	8 50	9 35	10 33						
	11	341 46.0	32.4					50	6 47	5 01	8 24	9 00	9 46	10 44	Moon's Lower Limb					
	12	356 46.1	- 8 31.5	41	Alphecca	126 47.9	+26 51.5	45	6 41	5 05	8 40	9 20	10 09	11 07	Add					
	13	11 46.2	30.5	1	Alpheratz	358 29.1	+28 50.7	40	6 36	5 08	8 53	9 36	10 27	11 26	Alt.	27	28	1		
	14	26 46.3	29.6	51	Altair	62 51.1	+ 8 44.8	35	6 32	5 09	9 04	9 50	10 43	11 42	°	'	'	'		
	15	41 46.4	28.7	2	Ankaa	353 59.0	-42 33.0	30	6 28	5 09	9 14	10 02	10 56	11 55	0	'	'	'		
	16	56 46.6	27.7	42	Antares	113 19.9	-26 20.1	20	6 21	5 09	9 32	10 23	11 19	12 19	4	18.6	18.5	18.3		
	17	71 46.7	26.8					10	6 15	5 06	9 47	10 41	11 39	12 39	8	18.6	18.5	18.3		
	18	86 46.8	- 8 25.9	37	Arcturus	146 35.3	+19 24.6	0	6 09	5 01	10 01	10 58	11 58	12 58	12	18.6	18.4	18.3		
	19	101 46.9	24.9	43	Atria	109 01.0	-68 56.7	10	6 04	4 52	10 15	11 15	12 16	13 17	16	18.5	18.4	18.3		
	20	116 47.0	24.0	22	Avior	234 35.5	-59 22.1	20	5 57	4 42	10 30	11 34	12 37	13 37	20	18.5	18.4	18.2		
	21	131 47.1	23.0	13	Bellatrix	279 18.8	+ 6 18.6	30	5 50	4 27	10 48	11 55	13 00	14 00	24	18.4	18.3	18.2		
	22	146 47.2	22.1	16	Betelge'se	271 48.5	+ 7 24.0	35	5 45	4 16	10 59	12 07	13 13	14 14	28	18.4	18.2	18.1		
23	161 47.3	21.2					40	5 40	4 03	11 11	12 22	13 29	14 30	32	18.3	18.2	18.1			
28	0	176 47.4	- 8 20.2	17	Canopus	264 15.3	-52 40.5	45	5 35	3 47	11 25	12 39	13 48	14 49	36	18.2	18.1	18.0		
	1	191 47.5	19.3	12	Capella	281 38.9	+45 57.5	50	5 28	3 26	11 42	13 00	14 12	15 12	40	18.1	18.0	17.9		
	2	206 47.7	18.3	53	Deneb	50 01.7	+45 07.0	52	5 24	3 16	11 50	13 11	14 23	15 23	44	18.0	17.9	17.8		
	3	221 47.8	17.4	28	Denebola	183 17.8	+14 49.1	54	5 21	3 03	11 59	13 22	14 36	15 36	48	17.9	17.8	17.7		
	4	236 47.9	16.4	4	Diphda	349 39.9	-18 14.0	56	5 17	2 48	12 10	13 35	14 51	15 51	52	17.7	17.7	17.6		
	5	251 48.0	15.5					58	5 12	2 29	12 22	13 51	15 09	16 08	56	17.6	17.5	17.4		
	6	266 48.1	- 8 14.6	27	Dubhe	194 44.3	+61 59.4	60	5 08	2 05	12 35	14 09	15 30	16 29	60	17.5	17.4	17.3		
	7	281 48.2	13.6	14	Elnath	279 07.8	+28 34.4	S							64	17.3	17.3	17.2		
	8	296 48.3	12.7	47	Eltanin	91 06.6	+51 29.3	Lat.	Sunset	Twlt. ends	Moonset				68	17.2	17.1	17.0		
	9	311 48.4	11.7	54	Enif	34 30.3	+ 9 40.1	N			27	28	1	2	72	17.0	17.0	16.9		
	10	326 48.6	10.8	56	Fomalhaut	16 12.4	-29 51.6	°	h m	h m	h m	h m	h m	h m	76	16.9	16.8	16.8		
	11	341 48.7	09.9					72	16 42	20 34	2 41	□	□	□	80	16.7	16.7	16.6		
	12	356 48.8	- 8 08.9	31	Gacrux	172 49.2	-56 51.8	70	16 52	20 20	1 33	□	□	□	84	16.5	16.5	16.5		
	13	11 48.9	08.0	29	Gienah	176 37.0	-17 17.8	68	17 00	20 09	0 57	3 30	□	□	88	16.4	16.3	16.3		
	14	26 49.0	07.0	35	Hadar	149 49.7	-60 09.4	66	17 07	20 00	0 32	2 35	4 45	□	90	16.2	16.2	16.2		
	15	41 49.1	06.1	6	Hamal	328 50.3	+23 15.2	64	17 13	19 53	0 13	2 02	3 46	5 04	Add to table, back cover					
	16	56 49.2	05.1	48	Kaus Aust.	84 41.9	-34 24.4	62	17 19	19 48	25 38	1 38	3 12	4 25	Moon's Upper Limb					
	17	71 49.3	04.2	40	Kochab	137 17.3	+74 19.9	60	17 23	19 42	25 19	1 19	2 48	3 58	Subtract					
	18	86 49.5	- 8 03.3	57	Markab	14 22.2	+14 57.8	58	17 27	19 38	25 03	1 03	2 28	3 37	Alt.	27	28	1		
	19	101 49.6	02.3	8	Menkar	315 00.9	+ 3 54.9	56	17 31	19 35	24 50	0 50	2 12	3 20	°	'	'	'		
	20	116 49.7	01.4	36	Menkent	148 58.9	-36 09.1	54	17 34	19 32	24 39	0 39	1 58	3 05	0	'	'	'		
	21	131 49.8	00.4	24	Miap'l'dus	221 48.3	-69 32.2	52	17 37	19 29	24 28	0 28	1 45	2 52	4	13.8	13.9	14.0		
	22	146 49.9	7 59.5					50	17 39	19 27	24 19	0 19	1 35	2 41	8	13.8	13.9	14.0		
23	161 50.0	58.5	9	Mirfak	309 43.1	+49 42.4	45	17 45	19 23	24 00	0 00	1 12	2 17	12	13.8	13.9	14.0			
1	0	176 50.2	- 7 57.6	50	Nunki	76 52.6	-26 21.2	40	17 50	19 20	23 45	24 54	0 54	1 58	16	13.9	13.9	14.0		
	1	191 50.3	56.6	52	Peacock	54 28.4	-56 52.7	35	17 54	19 18	23 31	24 39	0 39	1 43	20	14.0	14.0	14.1		
	2	206 50.4	55.7	21	Pollux	244 20.8	+28 08.1	30	17 58	19 18	23 20	24 26	0 26	1 29	24	14.0	14.1	14.2		
	3	221 50.5	54.7	20	Procyon	245 45.2	+ 5 20.3	20	18 05	19 18	23 00	24 04	0 04	1 06	28	14.1	14.2	14.3		
	4	236 50.6	53.8					10	18 10	19 20	22 44	23 44	24 45	0 45	32	14.2	14.3	14.4		
	5	251 50.7	52.9	46	R'alhague	96 47.1	+12 35.3	0	18 16	19 25	22 28	23 26	24 26	0 26	36	14.3	14.4	14.5		
	6	266 50.9	- 7 51.9	26	Regulus	208 29.6	+12 11.0	10	18 22	19 33	22 12	23 08	24 07	0 07	40	14.4	14.5	14.6		
	7	281 51.0	51.0	11	Rigel	281 54.0	- 8 15.3	20	18 28	19 43	21 55	22 49	23 47	24 48	44	14.5	14.6	14.7		
	8	296 51.1	50.0	38	Rigil Kent	140 51.2	-60 39.1	30	18 35	19 57	21 36	22 27	23 24	24 25	48	14.7	14.7	14.7		
	9	311 51.2	49.1	44	Sabik	103 02.7	-15 40.3	35	18 40	20 08	21 25	22 14	23 10	24 12	52	14.8	14.8	14.9		
	10	326 51.3	48.1					40	18 44	20 19	21 12	21 59	22 54	23 56	56	14.9	15.0	15.0		
	11	341 51.5	47.2	3	Schedar	350 31.0	+56 17.7	45	18 50	20 35	20 57	21 41	22 35	23 38	60	15.1	15.1	15.1		
	12	356 51.6	- 7 46.2	45	Shaula	97 21.3	-37 04.3	50	18 57	20 56	20 38	21 19	22 11	23 14	64	15.2	15.2	15.3		
	13	11 51.7	45.3	18	Sirius	259 12.0	-16 39.4	52	19 00	21 06	20 30	21 09	21 59	23 03	68	15.4	15.4	15.4		
	14	26 51.8	44.3	33	Spica	159 17.1	-10 55.9	54	19 04	21 19	20 20	20 57	21 46	22 51	72	15.5	15.5	15.5		
	15	41 51.9	43.4	23	Suhail	223 24.2	-43 15.3	56	19 07	21 33	20 09	20 43	21 31	22 36	76	15.7	15.7	15.7		
	16	56 52.1	42.4					58	19 12	21 51	19 57	20 27	21 14	22 19	80	15.9	15.9	15.8		
	17	71 52.2	41.5	49	Vega	81 08.7	+38 44.2	60	19 16	22 13	19 42	20 09	20 52	21 58	84	16.0	16.0	16.0		
	18	86 52.3	- 7 40.5	39	Zub'g'bi	137 53.7	-15 51.5	S							88	16.2	16.1	16.1		
	19	101 52.4	39.6								GMT of Transit				90	16.2	16.1	16.1		
	20	116 52.5	38.6	G M T	Equation of Time (App.—Mean)				Meridian of Greenwich								Subtract from table, back cover			
	21	131 52.7	37.7		27	28	1	DAY	Moon	Venus	Mars	Jupiter	Saturn							
	22	146 52.8	36.7																	

G M T	VENUS -3.7			MARS 1.5			JUPITER -2.0			SATURN 0.6			MOON			
	GHA	Dec.		GHA	Dec.		GHA	Dec.		GHA	Dec.		GHA	code	Dec.	code
h	o	'	o	'	o	'	o	'	o	'	o	'	o	'	o	'
20	159 00.7	220 31.7	-19 28.6	128 50.2	+12 41.2	47 02.5	+22 23.6	289 36.8	-15 45.0	83 30.5	49 +24 12.6	+ 4				
1	174 03.1	235 31.2	28.3	143 51.0	41.8	62 05.1	23.6	304 39.3	45.0	97 54.4	49 +24 13.0	+ 3				
2	189 05.6	250 30.6	27.9	158 51.8	42.5	77 07.6	23.7	319 41.7	45.0	112 18.3	49 +24 13.3	+ 1				
3	204 08.1	265 30.1	27.5	173 52.6	43.1	92 10.2	23.7	334 44.2	45.0	126 42.2	49 +24 13.4	- 1				
4	219 10.5	280 29.5	27.2	188 53.4	43.7	107 12.8	23.7	349 46.7	45.0	141 06.1	49 +24 13.3	- 2				
5	234 13.0	295 28.9	26.8	203 54.1	44.3	122 15.4	23.7	4 49.1	45.0	155 30.0	49 +24 13.1	- 3				
6	249 15.4	310 28.4	-19 26.4	218 54.9	+12 45.0	137 18.0	+22 23.7	19 51.6	-15 45.0	169 53.9	49 +24 12.2	- 6				
7	264 17.9	325 27.8	26.1	233 55.7	45.6	152 20.6	23.8	34 54.1	45.0	184 17.8	50 +24 12.8	- 7				
8	279 20.4	340 27.3	25.7	248 56.5	46.2	167 23.2	23.8	49 56.5	45.0	198 41.8	50 +24 11.5	- 8				
9	294 22.8	355 26.7	25.3	263 57.3	46.9	182 25.8	23.8	64 59.0	45.0	213 05.8	50 +24 10.7	- 10				
10	309 25.3	10 26.2	24.9	278 58.1	47.5	197 28.4	23.8	80 01.5	44.9	227 29.8	50 +24 09.7	- 12				
11	324 27.8	25 25.6	24.6	293 58.9	48.1	212 31.0	23.8	95 03.9	44.9	241 53.8	50 +24 08.5	- 13				
12	339 30.2	40 25.1	-19 24.2	308 59.7	+12 48.7	227 33.5	+22 23.8	110 06.4	-15 44.9	256 17.8	51 +24 07.2	- 15				
13	354 32.7	55 24.5	23.8	324 00.5	49.4	242 36.1	23.9	125 08.9	44.9	270 41.9	51 +24 05.7	- 17				
14	9 35.2	70 23.9	23.4	339 01.3	50.0	257 38.7	23.9	140 11.3	44.9	285 06.0	51 +24 04.0	- 18				
15	24 37.6	85 23.4	23.1	354 02.1	50.6	272 41.3	23.9	155 13.8	44.9	299 30.1	52 +24 02.2	- 20				
16	39 40.1	100 22.8	22.7	9 02.8	51.2	287 43.9	23.9	170 16.3	44.9	313 54.3	52 +24 00.2	- 21				
17	54 42.6	115 22.3	22.3	24 03.6	51.9	302 46.5	23.9	185 18.7	44.9	328 18.5	52 +23 58.1	- 23				
18	69 45.0	130 21.7	-19 21.9	39 04.4	+12 52.5	317 49.1	+22 24.0	200 21.2	-15 44.9	342 42.7	53 +23 55.8	- 24				
19	84 47.5	145 21.2	21.5	54 05.2	53.1	332 51.6	24.0	215 23.7	44.9	357 07.0	52 +23 53.4	- 26				
20	99 49.9	160 20.6	21.2	69 06.0	53.7	347 54.2	24.0	230 26.1	44.8	11 31.2	54 +23 50.8	- 28				
21	114 52.4	175 20.0	20.8	84 06.8	54.4	2 56.8	24.0	245 28.6	44.8	25 55.6	53 +23 48.0	- 29				
22	129 54.9	190 19.5	20.4	99 07.6	55.0	17 59.4	24.0	260 31.1	44.8	40 19.9	53 +23 45.1	- 30				
23	144 57.3	205 18.9	20.0	114 08.4	55.6	33 02.0	24.1	275 33.5	44.8	54 44.4	54 +23 42.1	- 33				
30	159 59.8	220 18.4	-19 19.6	129 09.2	+12 56.2	48 04.6	+22 24.1	290 36.0	-15 44.8	69 08.8	55 +23 38.8	- 33				
1	175 02.3	235 17.8	19.2	144 10.0	56.9	63 07.2	24.1	305 38.5	44.8	83 33.3	56 +23 35.5	- 35				
2	190 04.7	250 17.3	18.8	159 10.8	57.5	78 09.7	24.1	320 41.0	44.8	97 57.9	56 +23 32.0	- 37				
3	205 07.2	265 16.7	18.4	174 11.5	58.1	93 12.3	24.1	335 43.4	44.8	112 22.5	56 +23 28.3	- 38				
4	220 09.7	280 16.1	18.1	189 12.3	58.7	108 14.9	24.1	350 45.9	44.8	126 47.1	57 +23 24.5	- 40				
5	235 12.1	295 15.6	17.7	204 13.1	59.4	123 17.5	24.2	5 48.4	44.8	141 11.8	57 +23 20.5	- 41				
6	250 14.6	310 15.0	-19 17.3	219 13.9	+13 00.0	138 20.1	+22 24.2	20 50.8	-15 44.7	155 36.5	58 +23 16.4	- 43				
7	265 17.1	325 14.5	16.9	234 14.7	00.6	153 22.6	24.2	35 53.3	44.7	170 01.3	59 +23 12.1	- 44				
8	280 19.5	340 13.9	16.5	249 15.5	01.2	168 25.2	24.2	50 55.8	44.7	184 26.2	59 +23 07.7	- 46				
9	295 22.0	355 13.4	16.1	264 16.3	01.9	183 27.8	24.2	65 58.2	44.7	198 51.1	59 +23 03.1	- 47				
10	310 24.4	10 12.8	15.7	279 17.1	02.5	198 30.4	24.3	81 00.7	44.7	213 16.0	60 +22 58.4	- 49				
11	325 26.9	25 12.3	15.3	294 17.9	03.1	213 33.0	24.3	96 03.2	44.7	227 41.0	61 +22 53.5	- 50				
12	340 29.4	40 11.7	-19 14.9	309 18.6	+13 03.7	228 35.5	+22 24.3	111 05.7	-15 44.7	242 06.1	61 +22 48.5	- 51				
13	355 31.8	55 11.1	14.5	324 19.4	04.3	243 38.1	24.3	126 08.1	44.7	256 31.2	62 +22 43.4	- 53				
14	10 34.3	70 10.6	14.1	339 20.2	05.0	258 40.7	24.3	141 10.6	44.7	270 56.4	63 +22 38.1	- 54				
15	25 36.8	85 10.0	13.7	354 21.0	05.6	273 43.3	24.3	156 13.1	44.6	285 21.7	63 +22 32.7	- 56				
16	40 39.2	100 09.5	13.3	9 21.8	06.2	288 45.9	24.4	171 15.5	44.6	299 47.0	64 +22 27.1	- 57				
17	55 41.7	115 08.9	12.9	24 22.6	06.8	303 48.4	24.4	186 18.0	44.6	314 12.4	64 +22 21.4	- 58				
18	70 44.2	130 08.4	-19 12.5	39 23.4	+13 07.5	318 51.0	+22 24.4	201 20.5	-15 44.6	328 37.8	66 +22 15.6	- 60				
19	85 46.6	145 07.8	12.1	54 24.2	08.1	333 53.6	24.4	216 23.0	44.6	343 03.4	65 +22 09.6	- 61				
20	100 49.1	160 07.3	11.7	69 25.0	08.7	348 56.2	24.4	231 25.4	44.6	357 28.9	67 +22 03.5	- 63				
21	115 51.6	175 06.7	11.3	84 25.7	09.3	3 58.7	24.4	246 27.9	44.6	11 54.6	67 +21 57.2	- 64				
22	130 54.0	190 06.2	10.9	99 26.5	09.9	19 01.3	24.5	261 30.4	44.6	26 20.3	68 +21 50.8	- 65				
23	145 56.5	205 05.6	10.4	114 27.3	10.6	34 03.9	24.5	276 32.9	44.6	40 46.1	68 +21 44.3	- 67				
40	160 58.9	220 05.0	-19 10.0	129 28.1	+13 11.2	49 06.5	+22 24.5	291 35.3	-15 44.6	55 11.9	70 +21 37.6	- 67				
1	176 01.4	235 04.5	09.6	144 28.9	11.8	64 09.0	24.5	306 37.8	44.5	69 37.9	70 +21 30.9	- 68				
2	191 03.9	250 03.9	09.2	159 29.7	12.4	79 11.6	24.5	321 40.3	44.5	84 03.9	70 +21 24.0	- 71				
3	206 06.3	265 03.4	8.8	174 30.5	13.0	94 14.2	24.5	336 42.8	44.5	98 29.9	72 +21 16.9	- 71				
4	221 08.8	280 02.8	8.4	189 31.3	13.7	109 16.8	24.6	351 45.2	44.5	112 56.1	72 +21 09.8	- 73				
5	236 11.3	295 02.3	8.0	204 32.1	14.3	124 19.3	24.6	6 47.7	44.5	127 22.3	73 +21 02.5	- 75				
6	251 13.7	310 01.7	-19 07.6	219 32.8	+13 14.9	139 21.9	+22 24.6	21 50.2	-15 44.5	141 48.6	73 +20 55.0	- 75				
7	266 16.2	325 01.2	07.1	234 33.6	15.5	154 24.5	24.6	36 52.6	44.5	156 14.9	75 +20 47.5	- 77				
8	281 18.7	340 00.6	06.7	249 34.4	16.1	169 27.1	24.6	51 55.1	44.5	170 41.4	75 +20 39.8	- 77				
9	296 21.1	355 00.0	6.3	264 35.2	16.7	184 29.6	24.6	66 57.6	44.4	185 07.9	76 +20 32.1	- 79				
10	311 23.6	9 59.5	05.9	279 36.0	17.4	199 32.2	24.7	82 00.1	44.4	199 34.5	77 +20 24.2	- 81				
11	326 26.0	24 58.9	05.5	294 36.8	18.0	214 34.8	24.7	97 02.5	44.4	214 01.2	77 +20 16.1	- 81				
12	341 28.5	39 58.4	-19 05.0	309 37.6	+13 18.6	229 37.3	+22 24.7	112 05.0	-15 44.4	228 27.9	78 +20 08.0	- 83				
13	356 31.0	54 57.8	04.6	324 38.4	19.2	244 39.9	24.7	127 07.5	44.4	242 54.7	79 +19 59.7	- 83				
14	11 33.4	69 57.3	04.2	339 39.1	19.8	259 42.5	24.7	142 10.0	44.4	257 21.6	80 +19 51.4	- 85				
15	26 35.9	84 56.7	3.8	354 39.9	20.5	274 45.1	24.7	157 12.5	44.4	271 48.6	81 +19 42.9	- 86				
16	41 38.4	99 56.2	03.3	9 40.7	21.1	289 47.6	24.8	172 14.9	44.4	286 15.7	81 +19 34.3	- 87				
17	56 40.8	114 55.6	02.9	24 41.5	21.7	304 50.2	24.8	187 17.4	44.4	300 42.8	82 +19 25.6	- 88				
18	71 43.3	129 55.1	-19 02.5	39 42.3	+13 22.3	319 52.8	+22 24.8	202 19.9	-15 44.3	315 10.0	83 +19 16.8	- 89				
19	86 45.8	144 54.5	02.1	54 43.1	22.9	334 55.3	24.8	217 22.4	44.3	329 37.3	84 +19 07.9	- 91				
20	101 48.2	159 54.0	01.6	69 43.9	23.5	349 57.9	24.8	232 24.8	44.3	344 04.7	84 +18 58.8	- 91				
21	116 50.7	174 53.4	01.2	84 44.6	24.1	5 00.5	24.8	247 27.3	44.3	358 32.1	86 +18 49.7	- 92				
22	131 53.2	189 52.8	00.8	99 45.4	24.8	20 03.0	24.9	262 29.8	44.3	12 59.7	86 +18 40.5	- 94				
23	146 55.6	204 52.3	19 00.3	114 46.2	25.4	35 05.6	24.9	277 32.3	44.3	27 27.3	87 +18 31.1	- 94				
24	161 58.1	219 51.7	-18 59.9	129 47.0	+13 26.0	50 08.2	+22 24.9	292 34.8	-15 44.3	41 55.0	88 +18 21.7	- 96				
code	-	- 6	+ 4	+ 8	+ 6	+ 26	0	+ 24	0							

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS			
	GHA	Dec.	No.	Name	SHA	Dec.								Alt.	Sun's Low'r Limb Add	Venus Add	Mars Add
	h ° o '	° ° '			° ° '	° ° '	N °	h m	h m	h m	h m	h m	h m				
2	176 53.0	- 7 34.8	7	Acamar	315 51.6	-40 29.2	72	7 30	3 42	□	□	□	11 19				
1	191 53.1	33.9	5	Achernar	335 59.5	-57 28.0	70	7 21	3 57	□	□	□	12 07				
2	206 53.3	32.9	30	Acrux	173 57.7	-62 51.1	68	7 14	4 09	□	□	10 19	12 37				
3	221 53.4	32.0	19	Adhara	255 46.6	-28 54.8	66	7 08	4 19	□	8 57	11 03	12 59				
4	236 53.5	31.0	10	Aldebaran	291 39.5	+16 25.3	64	7 03	4 27	8 22	9 47	11 31	13 17				
5	251 53.6	30.1					62	6 59	4 33	9 00	10 19	11 53	13 31				
6	266 53.8	- 7 29.1	32	Alioth	166 58.3	+56 11.8	60	6 55	4 39	9 27	10 42	12 11	13 43				
7	281 53.9	28.2	34	Alkaid	153 32.8	+49 31.8	58	6 51	4 43	9 48	11 01	12 25	13 54				
8	296 54.0	27.2	55	Al Na'ir	28 38.9	-47 10.7	56	6 48	4 47	10 05	11 17	12 38	14 03				
9	311 54.1	26.3	15	Alnilam	276 30.6	- 1 13.8	54	6 46	4 50	10 20	11 30	12 49	14 11				
10	326 54.3	25.3	25	Alphard	218 38.7	- 8 28.0	52	6 43	4 53	10 33	11 42	12 58	14 18				
11	341 54.4	24.4					50	6 41	4 55	10 44	11 52	13 07	14 24				
12	356 54.5	- 7 23.4	41	Alphecca	126 47.8	+26 51.5	45	6 36	5 00	11 07	12 14	13 25	14 38				
13	11 54.6	22.5	1	Alpheratz	358 29.1	+28 50.6	40	6 32	5 03	11 26	12 31	13 40	14 49				
14	26 54.8	21.5	51	Altair	62 51.0	+ 8 44.8	35	6 28	5 05	11 42	12 46	13 52	14 59				
15	41 54.9	20.6	2	Ankaa	353 59.0	-42 33.0	30	6 25	5 06	11 55	12 59	14 03	15 07				
16	56 55.0	19.6	42	Antares	113 19.8	-26 20.1	20	6 19	5 07	12 19	13 20	14 22	15 22				
17	71 55.1	18.7					10	6 14	5 04	12 39	13 39	14 38	15 34				
18	86 55.3	- 7 17.7	37	Arcturus	146 35.3	+19 24.6	0	6 09	5 00	12 58	13 57	14 53	15 46				
19	101 55.4	16.8	43	Atria	109 01.0	-68 56.7	10	6 04	4 53	13 17	14 14	15 08	15 58				
20	116 55.5	15.8	22	Avior	234 35.5	-59 22.2	20	5 58	4 43	13 37	14 33	15 24	16 10				
21	131 55.6	14.9	13	Bellatrix	279 18.8	+ 6 18.6	30	5 52	4 29	14 00	14 55	15 43	16 25				
22	146 55.8	13.9	16	Betelge'se	271 48.5	+ 7 24.0	35	5 48	4 20	14 14	15 07	15 53	16 33				
23	161 55.9	13.0					40	5 44	4 09	14 30	15 22	16 05	16 42				
3	176 56.0	- 7 12.0	17	Canopus	264 15.3	-52 40.5	45	5 39	3 53	14 49	15 39	16 20	16 53				
1	191 56.1	11.0	12	Capella	281 39.0	+45 57.5	50	5 33	3 33	15 12	16 00	16 37	17 06				
2	206 56.3	10.1	53	Deneb	50 01.7	+45 07.0	52	5 30	3 23	15 23	16 10	16 45	17 12				
3	221 56.4	09.1	28	Denebola	183 17.8	+14 49.1	54	5 27	3 12	15 36	16 21	16 54	17 19				
4	236 56.5	08.2	4	Diphda	349 39.9	-18 14.0	56	5 24	2 59	15 51	16 34	17 05	17 26				
5	251 56.7	07.2					58	5 20	2 43	16 08	16 49	17 16	17 35				
6	266 56.8	- 7 06.3	27	Dubhe	194 44.3	+61 59.4	60	5 16	2 21	16 29	17 07	17 30	17 44				
7	281 56.9	05.3	14	Elnath	279 07.8	+28 34.4	S										
8	296 57.0	04.4	47	Eltanin	91 06.6	+51 29.3											
9	311 57.2	03.4	54	Enif	34 30.3	+ 9 40.1											
10	326 57.3	02.4	56	Fomalhaut	16 12.4	-29 51.6											
11	341 57.4	01.5															
12	356 57.6	- 7 00.5	31	Gacrux	172 49.2	-56 51.8	72	16 56	20 50	□	□	□	8 06				
13	11 57.7	6 59.6	29	Gienah	176 37.0	-17 17.8	70	17 05	20 34	□	□	□	7 17				
14	26 57.8	58.6	35	Hadar	149 49.6	-60 09.4	68	17 12	20 21	□	□	7 10	6 45				
15	41 58.0	57.7	6	Hamal	328 50.3	+23 15.2	66	17 18	20 11	□	6 32	6 26	6 22				
16	56 58.1	56.7	48	Kaus Aust.	84 41.9	-34 24.4	64	17 23	20 03	5 04	5 42	5 57	6 03				
17	71 58.2	55.8					62	17 27	19 56	4 25	5 10	5 35	5 48				
18	86 58.3	- 6 54.8	40	Kochab	137 17.2	+74 19.9	60	17 31	19 50	3 58	4 47	5 16	5 35				
19	101 58.5	53.8	57	Markab	14 22.2	+14 57.8	58	17 34	19 45	3 37	4 27	5 01	5 24				
20	116 58.6	52.9	8	Menkar	315 00.9	+ 3 54.9	56	17 37	19 41	3 20	4 11	4 48	5 14				
21	131 58.7	51.9	36	Menkent	148 58.9	-36 09.1	54	17 40	19 38	3 05	3 58	4 37	5 05				
22	146 58.9	51.0	24	Miap'l'dus	221 48.4	-69 32.2	52	17 42	19 34	2 52	3 46	4 27	4 57				
23	161 59.0	50.0					50	17 44	19 32	2 41	3 35	4 18	4 50				
4	176 59.1	- 6 49.0	9	Mirfak	309 43.1	+49 42.4	45	17 49	19 27	2 17	3 13	3 58	4 35				
1	191 59.3	48.1	50	Nunki	76 52.6	-26 21.2	40	17 53	19 23	1 58	2 55	3 43	4 23				
2	206 59.4	47.1	52	Peacock	54 28.3	-56 52.7	35	17 57	19 21	1 43	2 40	3 29	4 12				
3	221 59.5	46.2	21	Pollux	244 20.8	+28 08.1	30	18 00	19 20	1 29	2 27	3 18	4 03				
4	236 59.7	45.2	20	Procyon	245 45.2	+ 5 20.3	20	18 06	19 19	1 06	2 04	2 58	3 47				
5	251 59.8	44.3					10	18 11	19 21	0 45	1 45	2 41	3 32				
6	266 59.9	- 6 43.3	46	R'alhague	96 47.0	+12 35.3	0	18 16	19 25	0 26	1 26	2 24	3 19				
7	282 00.1	42.3	26	Regulus	208 29.6	+12 11.0	10	18 20	19 31	0 07	1 08	2 08	3 05				
8	297 00.2	41.4	11	Rigel	281 54.0	- 8 15.3	20	18 26	19 40	24 48	0 48	1 50	2 51				
9	312 00.3	40.4	38	Rigel Kent.	140 51.2	-60 39.1	30	18 32	19 54	24 25	0 25	1 29	2 34				
10	327 00.5	39.5	44	Sabik	103 02.7	-15 40.3	35	18 35	20 02	24 12	0 12	1 17	2 24				
11	342 00.6	38.5					40	18 40	20 14	23 56	25 04	1 04	2 13				
12	357 00.7	- 6 37.5	3	Schedar	350 31.0	+56 17.7	45	18 44	20 28	23 38	24 47	0 47	2 00				
13	12 00.9	36.6	45	Shaula	97 21.3	-37 04.3	50	18 50	20 47	23 14	24 27	0 27	1 43				
14	27 01.0	35.6	18	Sirius	259 12.0	-16 39.4	52	18 53	20 57	23 03	24 17	0 17	1 36				
15	42 01.2	34.7	33	Spica	159 17.1	-10 55.9	54	18 56	21 08	22 51	24 06	0 06	1 27				
16	57 01.3	33.7	23	Suhail	223 24.3	-43 15.3	56	18 59	21 21	22 36	23 54	25 18	1 18				
17	72 01.4	32.7					58	19 03	21 37	22 19	23 39	25 07	1 07				
18	87 01.6	- 6 31.8	49	Vega	81 08.7	+38 44.2	60	19 07	21 56	21 58	23 22	24 54	0 54				
19	102 01.7	30.8	39	Zub'g'bi	137 53.6	-15 51.5	S										
20	117 01.8	29.9															
21	132 02.0	28.9															
22	147 02.1	27.9															
23	162 02.2	27.0															
24	177 02.4	- 6 26.0															
code	-	+ 9															

Moon's Lower Limb
Add

Alt.	2	3	4
0	18.1	17.7	17.3
4	18.1	17.7	17.3
8	18.1	17.7	17.3
12	18.0	17.7	17.3
16	18.0	17.6	17.3
20	18.0	17.6	17.2
24	17.9	17.5	17.2
28	17.8	17.5	17.1
32	17.8	17.4	17.1
36	17.7	17.4	17.0
40	17.6	17.3	17.0
44	17.5	17.2	16.9
48	17.4	17.1	16.8
52	17.3	17.0	16.8
56	17.2	16.9	16.7
60	17.0	16.8	16.6
64	16.9	16.7	16.5
68	16.8	16.6	16.4
72	16.6	16.5	16.3
76	16.5	16.4	16.2
80	16.4	16.3	16.1
84	16.2	16.1	16.0
88	16.1	16.0	16.0
90			

Add to table,
back cover

Moon's Upper Limb
Subtract

G M T	VENUS -3.7				MARS 1.5				JUPITER -2.0				SATURN 0.6				MOON			
	GHA	GHA	Dec.		GHA	Dec.			GHA	Dec.			GHA	Dec.			GHA	code	Dec.	code
5	161 58.1	219 51.7	-18 59.9		129 47.0	+13 26.0			50 08.2	+22 24.9			292 34.8	-15 44.3			41 55.0	88 +18 21.7	- 96	
1	177 00.5	234 51.2	59.5		144 47.8	26.6			65 10.7	24.9			307 37.2	44.3			56 22.8	88 18 12.1	- 96	
2	192 03.0	249 50.6	59.0		159 48.6	27.2			80 13.3	24.9			322 39.7	44.2			70 50.6	89 18 02.5	- 98	
3	207 05.5	264 50.1	58.6		174 49.4	27.8			95 15.9	24.9			337 42.2	44.2			85 18.5	90 17 52.7	- 98	
4	222 07.9	279 49.5	58.2		189 50.1	28.4			110 18.4	25.0			352 44.7	44.2			99 46.5	91 17 42.9	- 99	
5	237 10.4	294 49.0	57.7		204 50.9	29.1			125 21.0	25.0			7 47.1	44.2			114 14.6	92 17 33.0	-100	
6	252 12.9	309 48.4	-18 57.3		219 51.7	+13 29.7			140 23.6	+22 25.0			22 49.6	-15 44.2			128 42.8	93 +17 23.0	-102	
7	267 15.3	324 47.9	56.9		234 52.5	30.3			155 26.1	25.0			37 52.1	44.2			143 11.1	93 17 12.8	-102	
8	282 17.8	339 47.3	56.4		249 53.3	30.9			170 28.7	25.0			52 54.6	44.2			157 39.4	94 17 02.6	-103	
9	297 20.3	354 46.8	56.0		264 54.1	31.5			185 31.3	25.0			67 57.1	44.2			172 07.8	95 16 52.3	-103	
10	312 22.7	9 46.2	55.5		279 54.9	32.1			200 33.8	25.0			82 59.5	44.1			186 36.3	96 16 42.0	-105	
11	327 25.2	24 45.7	55.1		294 55.6	32.7			215 36.4	25.1			98 02.0	44.1			201 04.9	96 16 31.5	-106	
12	342 27.7	39 45.1	-18 54.7		309 56.4	+13 33.4			230 38.9	+22 25.1			113 04.5	-15 44.1			215 33.5	97 +16 20.9	-106	
13	357 30.1	54 44.6	54.2		324 57.2	34.0			245 41.5	25.1			128 07.0	44.1			230 02.2	98 16 10.3	-107	
14	12 32.6	69 44.0	53.8		339 58.0	34.6			260 44.1	25.1			143 09.5	44.1			244 31.0	99 15 59.6	-108	
15	27 35.0	84 43.4	53.3		354 58.8	35.2			275 46.6	25.1			158 11.9	44.1			258 59.9	100 15 48.8	-109	
16	42 37.5	99 42.9	52.9		9 59.6	35.8			290 49.2	25.1			173 14.4	44.1			273 28.9	100 15 37.9	-110	
17	57 40.0	114 42.3	52.4		25 00.4	36.4			305 51.7	25.2			188 16.9	44.0			287 57.9	101 15 26.9	-110	
18	72 42.4	129 41.8	-18 52.0		40 01.1	+13 37.0			320 54.3	+22 25.2			302 19.4	-15 44.0			302 27.0	102 +15 15.9	-111	
19	87 44.9	144 41.2	51.5		55 01.9	37.6			335 56.9	25.2			218 21.9	44.0			316 56.2	103 15 04.8	-112	
20	102 47.4	159 40.7	51.1		70 02.7	38.2			350 59.4	25.2			233 24.3	44.0			331 25.5	103 14 53.6	-113	
21	117 49.8	174 40.1	50.6		85 03.5	38.9			6 02.0	25.2			248 26.8	44.0			345 54.8	104 14 42.3	-113	
22	132 52.3	189 39.6	50.2		100 04.3	39.5			21 04.5	25.2			263 29.3	44.0			0 24.2	105 14 31.0	-114	
23	147 54.8	204 39.0	49.7		115 05.1	40.1			36 07.1	25.2			278 31.8	44.0			14 53.7	106 14 19.6	-115	
6	162 57.2	219 38.5	-18 49.3		130 05.8	+13 40.7			51 09.7	+22 25.3			293 34.3	-15 44.0			29 23.3	106 +14 08.1	-115	
1	177 59.7	234 37.9	48.8		145 06.6	41.3			66 12.2	25.3			308 36.7	43.9			43 52.9	107 13 56.6	-116	
2	193 02.1	249 37.4	48.4		160 07.4	41.9			81 14.8	25.3			323 39.2	43.9			58 22.6	108 13 45.0	-117	
3	208 04.6	264 36.8	47.9		175 08.2	42.5			96 17.3	25.3			338 41.7	43.9			72 52.4	109 13 33.3	-117	
4	223 07.1	279 36.3	47.4		190 09.0	43.1			111 19.9	25.3			353 44.2	43.9			87 22.3	109 13 21.6	-118	
5	238 09.5	294 35.7	47.0		205 09.8	43.7			126 22.4	25.3			8 46.7	43.9			101 52.2	110 13 09.8	-119	
6	253 12.0	309 35.2	-18 46.5		220 10.5	+13 44.3			141 25.0	+22 25.3			23 49.2	-15 43.9			116 22.2	110 +12 57.9	-119	
7	268 14.5	324 34.6	46.1		235 11.3	44.9			156 27.6	25.4			38 51.6	43.9			130 52.2	112 12 46.0	-120	
8	283 16.9	339 34.1	45.6		250 12.1	45.6			171 30.1	25.4			53 54.1	43.8			145 22.4	112 12 34.0	-120	
9	298 19.4	354 33.5	45.1		265 12.9	46.2			186 32.7	25.4			68 56.6	43.8			159 52.6	113 12 22.0	-121	
10	313 21.9	9 33.0	44.7		280 13.7	46.8			201 35.2	25.4			83 59.1	43.8			174 22.9	113 12 09.9	-122	
11	328 24.3	24 32.4	44.2		295 14.5	47.4			216 37.8	25.4			99 01.6	43.8			188 53.2	114 11 57.7	-122	
12	343 26.8	39 31.9	-18 43.7		310 15.2	+13 48.0			231 40.3	+22 25.4			114 04.1	-15 43.8			203 23.6	115 +11 45.5	-122	
13	358 29.3	54 31.3	43.3		325 16.0	48.6			246 42.9	25.4			129 06.5	43.8			217 54.1	116 11 33.3	-123	
14	13 31.7	69 30.8	42.8		340 16.8	49.2			261 45.4	25.5			144 09.0	43.8			232 24.7	116 11 21.0	-123	
15	28 34.2	84 30.2	42.3		355 17.6	49.8			276 48.0	25.5			159 11.5	43.7			246 55.3	116 11 08.7	-124	
16	43 36.6	99 29.7	41.9		10 18.4	50.4			291 50.5	25.5			174 14.0	43.7			261 25.9	118 10 56.3	-125	
17	58 39.1	114 29.1	41.4		25 19.2	51.0			306 53.1	25.5			189 16.5	43.7			275 56.7	118 10 43.8	-125	
18	73 41.6	129 28.6	-18 40.9		40 19.9	+13 51.6			321 55.6	+22 25.5			204 19.0	-15 43.7			290 27.5	118 +10 31.3	-125	
19	88 44.0	144 28.0	40.5		55 20.7	52.2			336 58.2	25.5			219 21.5	43.7			304 58.3	120 10 18.8	-126	
20	103 46.5	159 27.5	40.0		70 21.5	52.8			352 00.7	25.5			234 23.9	43.7			319 29.3	120 10 06.2	-126	
21	118 49.0	174 26.9	39.5		85 22.3	53.4			7 03.3	25.6			249 26.4	43.7			334 00.3	120 9 53.6	-126	
22	133 51.4	189 26.4	39.0		100 23.1	54.0			22 05.8	25.6			264 28.9	43.6			348 31.3	121 9 41.0	-127	
23	148 53.9	204 25.8	38.6		115 23.9	54.6			37 08.4	25.6			279 31.4	43.6			3 02.4	122 9 28.3	-128	
7	163 56.4	219 25.3	-18 38.1		130 24.6	+13 55.3			52 10.9	+22 25.6			294 33.9	-15 43.6			17 33.6	122 + 9 15.5	-127	
1	178 58.8	234 24.7	37.6		145 25.4	55.9			67 13.5	25.6			309 36.4	43.6			32 04.8	123 9 02.8	-128	
2	194 01.3	249 24.2	37.1		160 26.2	56.5			82 16.0	25.6			324 38.9	43.6			46 36.1	123 8 50.0	-129	
3	209 03.7	264 23.6	36.7		175 27.0	57.1			97 18.6	25.6			339 41.3	43.6			61 07.4	124 8 37.1	-128	
4	224 06.2	279 23.1	36.2		190 27.8	57.7			112 21.1	25.6			354 43.8	43.6			75 38.8	125 8 24.3	-129	
5	239 08.7	294 22.5	35.7		205 28.5	58.3			127 23.7	25.7			9 46.3	43.5			90 10.3	125 8 11.4	-130	
6	254 11.1	309 22.0	-18 35.2		220 29.3	+13 58.9			142 26.2	+22 25.7			24 48.8	-15 43.5			104 41.8	126 + 7 58.4	-129	
7	269 13.6	324 21.4	34.7		235 30.1	59.5			157 28.8	25.7			39 51.3	43.5			119 13.4	126 7 45.5	-130	
8	284 16.1	339 20.9	34.2		250 30.9	60.1			172 31.3	25.7			54 53.8	43.5			133 45.0	126 7 32.5	-130	
9	299 18.5	354 20.3	33.8		265 31.7	60.7			187 33.9	25.7			69 56.3	43.5			148 16.6	128 7 19.5	-130	
10	314 21.0	9 19.8	33.3		280 32.4	61.3			202 36.4	25.7			84 58.8	43.5			162 48.4	127 7 06.5	-131	
11	329 23.5	24 19.3	32.8		295 33.2	61.9			217 39.0	25.7			100 01.2	43.5			177 20.1	128 6 53.4	-131	
12	344 25.9	39 18.7	-18 32.3		310 34.0	+14 62.5			232 41.5	+22 25.7			115 03.7	-15 43.4			191 51.9	129 + 6 40.3	-131	
13	359 28.4	54 18.2	31.8		325 34.8	63.1			247 44.0	25.8			130 06.2	43.4			206 23.8	129 6 27.2	-131	
14	14 30.9	69 17.6	31.3		340 35.6	63.7			262 46.6	25.8			145 08.7	43.4			220 55.7	130 6 14.1	-132	
15	29 33.3	84 17.1	30.8		355 36.4	64.3			277 49.1	25.8			160 11.2	43.4			235 27.7	130 6 00.9	-131	
16	44 35.8	99 16.5	30.3		10 37.1	64.9			292 51.7	25.8			175 13.7	43.4			249 59.7	131 5 47.8	-132	
17	59 38.2	114 16.0	29.9		25 37.															

G M T	SUN			STARS			Lat.	Sunrise	Twilt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS				
	GHA	Dec.	No.	Name	SHA	Dec.				5	6	7	8	Alt.	Sun's Low'r Limb	Venus Add	Mars Add	
h	°	'	°	°	'	°	N	h m	h m	h m	h m	h m	h m	°	'	'	'	
5	177	02.4	- 6	26.0	7	Acamar	315 51.6	-40 29.2	72	7 14	3 23	11 19	14 00	16 10	18 09			
1	192	02.5		25.0	5	Achernar	335 59.5	-57 28.0	70	7 07	3 41	12 07	14 20	16 18	18 09			
2	207	02.7		24.1	30	Acrux	173 57.7	-62 51.1	68	7 02	3 56	12 37	14 35	16 25	18 09			
3	222	02.8	..	23.1	19	Adhara	255 46.7	-28 54.9	66	6 57	4 07	12 59	14 48	16 31	18 09			
4	237	02.9	..	22.2	10	Aldebaran	291 39.5	+16 25.3	64	6 53	4 15	13 17	14 58	16 35	18 09			
5	252	03.1		21.2					62	6 49	4 23	13 31	15 07	16 39	18 09			
6	267	03.2	- 6	20.2	32	Alioth	166 58.3	+56 11.9	60	6 46	4 29	13 43	15 15	16 43	18 09			
7	282	03.4		19.3	34	Alkaid	153 32.8	+49 31.8	58	6 43	4 35	13 54	15 21	16 46	18 09			
8	297	03.5		18.3	55	Al Na'ir	28 38.8	-47 10.7	56	6 41	4 39	14 03	15 27	16 49	18 09			
9	312	03.6	..	17.3	15	Alnilam	276 30.6	- 1 13.8	54	6 39	4 43	14 11	15 32	16 52	18 09			
10	327	03.8		16.4	25	Alphard	128 38.7	- 8 28.0	52	6 37	4 46	14 18	15 37	16 54	18 09			
11	342	03.9		15.4					50	6 35	4 49	14 24	15 41	16 56	18 09			
12	357	04.0	- 6	14.5	41	Alphecca	216 47.8	+26 51.5	45	6 31	4 54	14 38	15 50	17 00	18 09			
13	12	04.2		13.5	1	Alpheratz	358 29.1	+28 50.6	40	6 27	4 59	14 49	15 58	17 04	18 08			
14	27	04.3		12.5	51	Altair	62 51.0	+ 8 44.8	35	6 24	5 01	14 59	16 04	17 07	18 08			
15	42	04.5	..	11.6	2	Ankaa	353 59.0	-42 33.0	30	6 21	5 04	15 07	16 10	17 10	18 08			
16	57	04.6		10.6	42	Antares	113 19.8	-26 20.1	20	6 17	5 04	15 22	16 20	17 15	18 08			
17	72	04.7		09.6					10	6 12	5 03	15 34	16 28	17 19	18 08			
18	87	04.9	- 6	08.7	37	Arcturus	146 35.3	+19 24.6	0	6 08	4 59	15 46	16 36	17 23	18 08			
19	102	05.0		07.7	43	Atria	109 00.9	-68 56.7	10	6 04	4 54	15 58	16 44	17 27	18 08			
20	117	05.2		06.7	22	Avior	234 35.5	-59 22.2	20	5 59	4 45	16 10	16 52	17 31	18 08			
21	132	05.3	..	05.8	13	Bellatrix	279 18.8	+ 6 18.6	30	5 54	4 32	16 25	17 02	17 36	18 08			
22	147	05.5		04.8	16	Betelge'se	271 48.5	+ 7 24.0	35	5 51	4 23	16 33	17 08	17 39	18 09			
23	162	05.6		03.8					40	5 47	4 12	16 42	17 14	17 42	18 09			
					17	Canopus	264 15.4	-52 40.5	45	5 43	3 58	16 53	17 21	17 46	18 09			
6	177	05.7	- 6	02.9	12	Capella	281 39.0	+45 57.5	50	5 38	3 40	17 06	17 30	17 50	18 09			
1	192	05.9		01.9	53	Deneb	50 01.7	+45 07.0	52	5 35	3 31	17 12	17 34	17 52	18 09			
2	207	06.0		00.9	28	Denebola	183 17.8	+14 49.1	54	5 33	3 21	17 19	17 38	17 54	18 09			
3	222	06.2	..	6 00.0	4	Diphda	349 39.9	-18 14.0	56	5 30	3 08	17 26	17 43	17 57	18 09			
4	237	06.3		5 59.0					58	5 27	2 53	17 35	17 48	17 59	18 09			
5	252	06.5		58.0	27	Dubhe	194 44.3	+61 59.4	60	5 23	2 36	17 44	17 54	18 02	18 09			
6	267	06.6	- 5	57.1	14	Elnath	279 07.8	+28 34.4	S									
7	282	06.7		56.1	47	Eltanin	91 06.6	+51 29.3										
8	297	06.9		55.1	54	Enif	34 30.3	+ 9 40.1										
9	312	07.0	..	54.2	56	Fomalhaut	16 12.4	-29 51.6										
10	327	07.2		53.2					N	°	h m	h m	h m	h m	h m			
11	342	07.3		52.2	31	Gacrux	172 49.2	-56 51.8	72	17 11	21 09	8 06	7 11	6 41	6 18			
12	357	07.5	- 5	51.3	29	Gienah	176 37.0	-17 17.8	70	17 17	20 49	7 17	6 49	6 30	6 14			
13	12	07.6		50.3	35	Hadar	149 49.6	-60 09.4	68	17 23	20 34	6 45	6 31	6 21	6 11			
14	27	07.8		49.3	6	Hamal	328 50.3	+23 15.2	66	17 28	20 22	6 22	6 17	6 13	6 09			
15	42	07.9	..	48.4	48	Kaus Aust.	84 41.8	-34 24.4	64	17 32	20 13	6 03	6 06	6 07	6 07			
16	57	08.0		47.4					62	17 35	20 04	5 48	5 56	6 01	6 05			
17	72	08.2		46.4	40	Kochab	137 17.2	+74 19.9	60	17 38	19 58	5 35	5 47	5 56	6 04			
18	87	08.3	- 5	45.5	57	Markab	14 22.2	+14 57.8	58	17 41	19 53	5 24	5 40	5 52	6 02			
19	102	08.5		44.5	8	Menkar	315 00.9	+ 3 54.9	56	17 43	19 47	5 14	5 33	5 48	6 01			
20	117	08.6		43.5	36	Menkent	148 58.9	-36 09.1	54	17 45	19 43	5 05	5 27	5 45	6 00			
21	132	08.8	..	42.6	24	Miapl'dus	221 48.4	-69 32.2	52	17 47	19 40	4 57	5 22	5 41	5 59			
22	147	08.9		41.6					50	17 49	19 37	4 50	5 17	5 39	5 59			
23	162	09.1		40.6	9	Mirfak	309 43.2	+49 42.4	45	17 53	19 31	4 35	5 06	5 32	5 56			
					50	Nunki	76 52.5	-26 21.2	40	17 56	19 26	4 23	4 57	5 27	5 54			
7	177	09.2	- 5	39.7	52	Peacock	54 28.3	-56 52.7	35	17 59	19 23	4 12	4 49	5 22	5 53			
1	192	09.4		38.7	21	Pollux	244 20.8	+28 08.1	30	18 02	19 21	4 03	4 42	5 18	5 51			
2	207	09.5		37.7	20	Procyon	245 45.2	+ 5 20.3	20	18 07	19 20	3 47	4 31	5 11	5 49			
3	222	09.7	..	36.8					10	18 11	19 21	3 32	4 20	5 05	5 47			
4	237	09.8		35.8	46	R'alhague	96 47.0	+12 35.3	0	18 15	19 24	3 19	4 10	4 59	5 45			
5	252	09.9		34.8	26	Regulus	208 29.6	+12 11.0	10	18 19	19 29	3 05	4 00	4 53	5 43			
6	267	10.1	- 5	33.8	11	Rigel	281 54.0	- 8 15.3	20	18 23	19 37	2 51	3 50	4 46	5 41			
7	282	10.2		32.9	38	Rigel Kent.	140 51.2	-60 39.1	30	18 29	19 50	2 34	3 37	4 39	5 38			
8	297	10.4		31.9	44	Sabik	103 02.6	-15 40.3	35	18 32	19 58	2 24	3 30	4 34	5 37			
9	312	10.5	..	30.9					40	18 35	20 08	2 13	3 22	4 30	5 35			
10	327	10.7		30.0	3	Schedar	350 31.0	+56 17.7	45	18 39	20 22	2 00	3 13	4 24	5 33			
11	342	10.8		29.0	45	Shaula	97 21.3	-37 04.3	50	18 44	20 39	1 43	3 01	4 17	5 31			
12	357	11.0	- 5	28.0	18	Sirius	259 12.1	-16 39.4	52	18 46	20 48	1 36	2 55	4 14	5 30			
13	12	11.1		27.1	33	Spica	159 17.0	-10 55.9	54	18 49	20 58	1 27	2 49	4 10	5 28			
14	27	11.3		26.1	23	Suhail	223 24.3	-43 15.3	56	18 52	21 11	1 18	2 43	4 06	5 27			
15	42	11.4	..	25.1					58	18 55	21 24	1 07	2 35	4 02	5 26			
16	57	11.6		24.1	49	Vega	81 08.7	+38 44.2	60	18 58	21 41	0 54	2 27	3 57	5 24			
17	72	11.7		23.2	39	Zub'g'bi	137 53.6	-15 51.6	S									
18	87	11.9	- 5	22.2														
19	102	12.0		21.2	G M T	Equation of Time (App.—Mean)			GMT of Transit Meridian of Greenwich									
20	117	12.2		20.3		5	6	7	DAY	Moon	Venus	Mars	Jupiter	Saturn				
21	132	12.3	..	19.3	h	m s	m s	m s		h m	h m	h m	h m	h m				
22	147	12.5		18.3	0	-11 50.8	-11 37.3	-11 23.5	5	21 58	9 21	15 20	20 36	4 29				
23	162	12.6		17.3	6	-11 47.4	-11 33.9	-11 19.9	6	22 47	9 22	15 19	20 32	4 25				
					12	-11 44.1	-11 30.4	-11 16.3	7	23 34	9 23	15 18	20 28	4 21				
					18	-11 40.7	-11 27.0	-11 12.8	8	24 19	9 24	15 16	20 24	4 17				
					24	-11 37.3	-11 23.5	-11 09.2										
code	-		+ 10															

G M T	VENUS -3.7		MARS 1.5		JUPITER -2.0		SATURN 0.6		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
h	o		o		o		o		o		o	
8	0	164 55.5	219 12.1	-18 26.4	130 43.4	+14 09.7	53 12.0	+22 25.9	295 33.6	-15 43.3	6 17.3	134 + 4 01.9 -133
1	179 58.0	234 11.6	25.9	145 44.1	10.3	68 14.6	25.9	310 36.1	43.2	20 49.7	135	3 48.6 -132
2	195 00.4	249 11.1	25.4	160 44.9	10.9	83 17.1	25.9	325 38.6	43.2	35 22.2	134	3 35.4 -133
3	210 02.9	264 10.5	.. 24.9	175 45.7	.. 11.5	98 19.6	.. 25.9	340 41.1	.. 43.2	49 54.6	135	3 22.1 -133
4	225 05.4	279 10.0	24.4	190 46.5	12.1	113 22.2	25.9	355 43.6	43.2	64 27.1	136	3 08.8 -133
5	240 07.8	294 09.4	23.9	205 47.3	12.7	128 24.7	26.0	10 46.1	43.2	78 59.7	135	2 55.5 -133
6	255 10.3	309 08.9	-18 23.4	220 48.0	+14 13.3	143 27.3	+22 26.0	25 48.6	-15 43.2	93 32.2	136 +	2 42.2 -133
7	270 12.7	324 08.3	22.9	235 48.8	13.9	158 29.8	26.0	40 51.0	43.2	108 04.8	137	2 28.9 -133
8	285 15.2	339 07.8	22.4	250 49.6	14.5	173 32.3	26.0	55 53.5	43.1	122 37.5	136	2 15.6 -133
9	300 17.7	354 07.2	.. 21.9	265 50.4	.. 15.1	188 34.9	.. 26.0	70 56.0	.. 43.1	137 10.1	137	2 02.3 -133
10	315 20.1	9 06.7	21.4	280 51.2	15.7	203 37.4	26.0	85 58.5	43.1	151 42.8	138	1 49.0 -133
11	330 22.6	24 06.1	20.8	295 51.9	16.3	218 39.9	26.0	101 01.0	43.1	166 15.6	137	1 35.7 -133
12	345 25.1	39 05.6	-18 20.3	310 52.7	+14 16.9	233 42.5	+22 26.0	116 03.5	-15 43.1	180 48.3	138 +	1 22.4 -133
13	0 27.5	54 05.1	19.8	325 53.5	17.5	248 45.0	26.0	131 06.0	43.1	195 21.1	138	1 09.1 -133
14	15 30.0	69 04.5	19.3	340 54.3	18.1	263 47.6	26.1	146 08.5	43.0	209 53.9	139	0 55.8 -133
15	30 32.5	84 04.0	.. 18.8	355 55.1	.. 18.7	278 50.1	.. 26.1	161 11.0	.. 43.0	224 26.8	138	0 42.5 -133
16	45 34.9	99 03.4	18.3	10 55.8	19.3	293 52.6	26.1	176 13.5	43.0	238 59.6	139	0 29.2 -132
17	60 37.4	114 02.9	17.8	25 56.6	19.8	308 55.2	26.1	191 16.0	43.0	253 32.5	140	0 16.0 -133
18	75 39.8	129 02.3	-18 17.3	40 57.4	+14 20.4	323 57.7	+22 26.1	206 18.5	-15 43.0	268 05.5	139 +	0 02.7 -132
19	90 42.3	144 01.8	16.7	55 58.2	21.0	339 00.2	26.1	221 21.0	43.0	282 38.4	140	0 10.5 -132
20	105 44.8	159 01.2	16.2	70 58.9	21.6	354 02.8	26.1	236 23.5	42.9	297 11.4	140	0 23.7 -133
21	120 47.2	174 00.7	.. 15.7	85 59.7	.. 22.2	9 05.3	.. 26.1	251 25.9	.. 42.9	311 44.4	140	0 37.0 -132
22	135 49.7	189 00.2	15.2	101 00.5	22.8	24 07.8	26.1	266 28.4	42.9	326 17.4	140	0 50.2 -131
23	150 52.2	203 59.6	14.7	116 01.3	23.4	39 10.4	26.2	281 30.9	42.9	340 50.4	141	1 03.3 -132
9	0	165 54.6	218 59.1	-18 14.2	131 02.1	+14 24.0	54 12.9	+22 26.2	296 33.4	-15 42.9	355 23.5	140 - 1 16.5 -132
1	180 57.1	233 58.5	13.6	146 02.8	24.6	69 15.4	26.2	311 35.9	42.9	9 56.5	141	1 29.7 -131
2	195 59.6	248 58.0	13.1	161 03.6	25.2	84 18.0	26.2	326 38.4	42.8	24 29.6	141	1 42.8 -131
3	211 02.0	263 57.4	.. 12.6	176 04.4	.. 25.8	99 20.5	.. 26.2	341 40.9	.. 42.8	39 02.7	141	1 55.9 -131
4	226 04.5	278 56.9	12.1	191 05.2	26.4	114 23.0	26.2	356 43.4	42.8	53 35.8	142	2 09.0 -131
5	241 07.0	293 56.4	11.5	206 05.9	27.0	129 25.5	26.2	11 45.9	42.8	68 09.0	141	2 22.1 -131
6	256 09.4	308 55.8	-18 11.0	221 06.7	+14 27.6	144 28.1	+22 26.2	26 48.4	-15 42.8	82 42.1	142	2 35.2 -130
7	271 11.9	323 55.3	10.5	236 07.5	28.2	159 30.6	26.2	41 50.9	42.8	97 15.3	142	2 48.2 -130
8	286 14.3	338 54.7	10.0	251 08.3	28.8	174 33.1	26.3	56 53.4	42.7	111 48.5	141	3 01.2 -130
9	301 16.8	353 54.2	.. 09.4	266 09.0	.. 29.3	189 35.7	.. 26.3	71 55.9	.. 42.7	126 21.6	143	3 14.2 -130
10	316 19.3	8 53.7	08.9	281 09.8	29.9	204 38.2	26.3	86 58.4	42.7	140 54.9	142	3 27.2 -129
11	331 21.7	23 53.1	08.4	296 10.6	30.5	219 40.7	26.3	102 00.9	42.7	155 28.1	142	3 40.1 -129
12	346 24.2	38 52.6	-18 07.8	311 11.4	+14 31.1	234 43.2	+22 26.3	117 03.4	-15 42.7	170 01.3	142	3 53.0 -129
13	1 26.7	53 52.0	07.3	326 12.2	31.7	249 45.8	26.3	132 05.9	42.7	184 34.5	143	4 05.9 -128
14	16 29.1	68 51.5	06.8	341 12.9	32.3	264 48.3	26.3	147 08.4	42.6	199 07.8	142	4 18.7 -129
15	31 31.6	83 50.9	.. 06.2	356 13.7	.. 32.9	279 50.8	.. 26.3	162 10.9	.. 42.6	213 41.0	143	4 31.6 -127
16	46 34.1	98 50.4	05.7	11 14.5	33.5	294 53.4	26.3	177 13.4	42.6	228 14.3	142	4 44.3 -128
17	61 36.5	113 49.9	05.2	26 15.3	34.1	309 55.9	26.3	192 15.9	42.6	242 47.5	143	4 57.1 -127
18	76 39.0	128 49.3	-18 04.6	41 16.0	+14 34.7	324 58.4	+22 26.4	207 18.4	-15 42.6	257 20.8	143	5 09.8 -127
19	91 41.4	143 48.8	04.1	56 16.8	35.3	340 00.9	26.4	222 20.9	42.6	271 54.1	142	5 22.5 -127
20	106 43.9	158 48.2	03.6	71 17.6	35.8	355 03.5	26.4	237 23.4	42.5	286 27.3	143	5 35.2 -126
21	121 46.4	173 47.7	.. 03.0	86 18.4	.. 36.4	10 06.0	.. 26.4	252 25.9	.. 42.5	301 00.6	143	5 47.8 -126
22	136 48.8	188 47.2	02.5	101 19.1	37.0	25 08.5	26.4	267 28.4	42.5	315 33.9	143	6 00.4 -126
23	151 51.3	203 46.6	02.0	116 19.9	37.6	40 11.0	26.4	282 30.9	42.5	330 07.2	143	6 13.0 -125
10	0	166 53.8	218 46.1	-18 01.4	131 20.7	+14 38.2	55 13.6	+22 26.4	297 33.4	-15 42.5	344 40.5	142 - 6 25.5 -124
1	181 56.2	233 45.5	00.9	146 21.5	38.8	70 16.1	26.4	312 35.9	42.4	359 13.7	143	6 37.9 -125
2	196 58.7	248 45.0	18 00.3	161 22.2	39.4	85 18.6	26.4	327 38.4	42.4	13 47.0	143	6 50.4 -124
3	212 01.2	263 44.5	.. 17 59.8	176 23.0	.. 40.0	100 21.1	.. 26.4	342 40.9	.. 42.4	28 20.3	143	7 02.8 -123
4	227 03.6	278 43.9	59.2	191 23.8	40.5	115 23.6	26.5	357 43.4	42.4	42 53.6	143	7 15.1 -124
5	242 06.1	293 43.4	58.7	206 24.6	41.1	130 26.2	26.5	12 45.9	42.4	57 26.9	142	7 27.5 -122
6	257 08.6	308 42.9	-17 58.1	221 25.3	+14 41.7	145 28.7	+22 26.5	27 48.4	-15 42.4	72 00.1	143	7 39.7 -123
7	272 11.0	323 42.3	57.6	236 26.1	42.3	160 31.2	26.5	42 50.9	42.3	86 33.4	143	7 52.0 -121
8	287 13.5	338 41.8	57.0	251 26.9	42.9	175 33.7	26.5	57 53.4	42.3	101 06.7	142	8 04.1 -122
9	302 15.9	353 41.2	.. 56.5	266 27.7	.. 43.5	190 36.3	.. 26.5	72 55.9	.. 42.3	115 39.9	143	8 16.3 -121
10	317 18.4	8 40.7	55.9	281 28.4	44.1	205 38.8	26.5	87 58.4	42.3	130 13.2	142	8 28.4 -120
11	332 20.9	23 40.2	55.4	296 29.2	44.7	220 41.3	26.5	103 00.9	42.3	144 46.4	143	8 40.4 -120
12	347 23.3	38 39.6	-17 54.8	311 30.0	+14 45.2	235 43.3	+22 26.5	118 03.4	-15 42.3	159 19.7	142	8 52.4 -120
13	2 25.8	53 39.1	54.3	326 30.8	45.8	250 46.8	26.5	133 05.9	42.2	173 52.9	142	9 04.4 -119
14	17 28.3	68 38.6	53.7	341 31.5	46.4	265 48.8	26.5	148 08.4	42.2	188 26.1	142	9 16.3 -118
15	32 30.7	83 38.0	.. 53.2	356 32.3	.. 47.0	280 51.4	.. 26.6	163 10.9	.. 42.2	202 59.3	142	9 28.1 -118
16	47 33.2	98 37.5	52.6	11 33.1	47.6	295 53.9	26.6	178 13.4	42.2	217 32.5	142	9 39.9 -118
17	62 35.7	113 36.9	52.1	26 33.8	48.2	310 56.4	26.6	193 15.9	42.2	232 05.7	142	9 51.7 -117
18	77 38.1	128 36.4	-17 51.5	41 34.6	+14 48.7	325 58.9	+22 26.6	208 18.4	-15 42.1	246 38.9	142	-10 03.4 -116
19	92 40.6	143 35.9	51.0	56 35.4	49.3	341 01.4	26.6	223 20.9	42.1	261 12.1	141	10 15.0 -116
20	107 43.1	158 35.3	50.4	71 36.2	49.9	356 03.9	26.6	238 23.4	42.1	275 45.2	142	10 26.6 -116
21	122 45.5	173 34.8	.. 49.8	86 36.9	.. 50.5	11 06.5	.. 26.6	253 25.9	.. 42.1	290 18.4	141	10 38.2 -115
22	137 48.0	188 34.3	49.3	101 37.7	51.1	26 09.0	26.6	268 28.4	42.1	304 51.5	141	10 49.7 -114
23	152 50.4	203 33.7	48.7	116 38.5	51.7	41 11.5	26.6	283 30.9	42.1	319 24.6	141	11 01.1 -114
24	167 52.9	218 33.2	-17 48.2	131 39.3	+14 52.3	56 14.0	+22 26.6	298 33.4	-15 42.0	333 57.7	141	-11 12.5 -113
code	-	- 6	+ 5	+ 8	+ 6	+ 26	0	+ 25	0			

G M T	VENUS -3.6		MARS 1.5		JUPITER -2.0		SATURN 0.6		MOON				
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code	
11	h												
0	167 52.9	218 33.2	-17 48.2	131 39.3	+14 52.3	56 14.0	+22 26.6	298 33.4	-15 42.0	333 57.7	141	-11 12.5 -113	
1	182 55.4	233 32.7	47.6	146 40.0	52.8	71 16.5	26.6	313 35.9	42.0	348 30.8	141	11 23.8 -112	
2	197 57.8	248 32.1	47.0	161 40.8	53.4	86 19.0	26.6	328 38.4	42.0	3 03.9	140	11 35.0 -112	
3	213 00.3	263 31.6	46.5	176 41.6	54.0	101 21.6	26.7	343 40.9	42.0	17 36.9	141	-11 46.2 -112	
4	228 02.8	278 31.0	45.9	191 42.3	54.6	116 24.1	26.7	358 43.4	42.0	32 10.0	140	11 57.4 -111	
5	243 05.2	293 30.5	45.3	206 43.1	55.2	131 26.6	26.7	13 45.9	41.9	46 43.0	140	12 08.5 -110	
6	258 07.7	308 30.0	-17 44.8	221 43.9	+14 55.7	146 29.1	+22 26.7	28 48.4	-15 41.9	61 16.0	140	-12 19.5 -109	
7	273 10.2	323 29.4	44.2	236 44.7	56.3	161 31.6	26.7	43 50.9	41.9	75 49.0	139	12 30.4 -109	
8	288 12.6	338 28.9	43.6	251 45.4	56.9	176 34.1	26.7	58 53.4	41.9	90 21.9	140	12 41.3 -109	
9	303 15.1	353 28.4	43.0	266 46.2	57.5	191 36.6	26.7	73 55.9	41.9	104 54.9	139	-12 52.2 -107	
10	318 17.5	8 27.8	42.5	281 47.0	58.1	206 39.1	26.7	88 58.4	41.8	119 27.8	139	13 02.9 -107	
11	333 20.0	23 27.3	41.9	296 47.8	58.6	221 41.7	26.7	104 00.9	41.8	134 00.7	139	13 13.6 -107	
12	348 22.5	38 26.8	-17 41.3	311 48.5	+14 59.2	236 44.2	+22 26.7	119 03.4	-15 41.8	148 33.6	138	-13 24.3 -106	
13	3 24.9	53 26.2	40.8	326 49.3	14 59.8	251 46.7	26.7	134 05.9	41.8	163 06.4	139	13 34.9 -105	
14	18 27.4	68 25.7	40.2	341 50.1	15 00.4	266 49.2	26.7	149 08.4	41.8	177 39.3	138	13 45.4 -104	
15	33 29.9	83 25.2	39.6	356 50.8	01.0	281 51.7	26.8	164 10.9	41.7	192 12.1	138	-13 55.8 -104	
16	48 32.3	98 24.6	39.0	11 51.6	01.5	296 54.2	26.8	179 13.5	41.7	206 44.9	137	14 06.2 -103	
17	63 34.8	113 24.1	38.5	26 52.4	02.1	311 56.7	26.8	194 16.0	41.7	221 17.6	138	14 16.5 -102	
18	78 37.3	128 23.6	-17 37.9	41 53.2	+15 02.7	326 59.2	+22 26.8	209 18.5	-15 41.7	235 50.4	137	-14 26.7 -102	
19	93 39.7	143 23.0	37.3	56 53.9	03.3	342 01.7	26.8	224 21.0	41.7	250 23.1	137	14 36.9 -101	
20	108 42.2	158 22.5	36.7	71 54.7	03.9	357 04.2	26.8	239 23.5	41.7	264 55.8	137	14 47.0 -100	
21	123 44.7	173 22.0	36.1	86 55.5	04.4	12 06.7	26.8	254 26.0	41.6	279 28.5	136	-14 57.0 -100	
22	138 47.1	188 21.5	35.6	101 56.2	05.0	27 09.2	26.8	269 28.5	41.6	294 01.1	136	15 07.0 -98	
23	153 49.6	203 20.9	35.0	116 57.0	05.6	42 11.8	26.8	284 31.0	41.6	308 33.7	136	15 16.8 -98	
12	0	168 52.0	218 20.4	-17 34.4	131 57.8	+15 06.2	57 14.3	+22 26.8	299 33.5	-15 41.6	323 06.3	136	-15 26.6 -98
1	183 54.5	233 19.9	33.8	146 58.5	06.8	72 16.8	26.8	314 36.0	41.6	337 38.9	135	15 36.4 -96	
2	198 57.0	248 19.3	33.2	161 59.3	07.3	87 19.3	26.8	329 38.5	41.5	352 11.4	135	15 46.0 -96	
3	213 59.4	263 18.8	32.6	177 00.1	07.9	102 21.8	26.8	344 41.0	41.5	6 43.9	135	-15 55.6 -95	
4	229 01.9	278 18.3	32.0	192 00.9	08.5	117 24.3	26.8	359 43.5	41.5	21 16.4	135	16 05.1 -95	
5	244 04.4	293 17.7	31.5	207 01.6	09.1	132 26.8	26.9	14 46.0	41.5	35 48.9	134	16 14.6 -93	
6	259 06.8	308 17.2	-17 30.9	222 02.4	+15 09.6	147 29.3	+22 26.9	29 48.6	-15 41.5	50 21.3	134	-16 23.9 -93	
7	274 09.3	323 16.7	30.3	237 03.2	10.2	162 31.8	26.9	44 51.1	41.4	64 53.7	134	16 33.2 -92	
8	289 11.8	338 16.1	29.7	252 03.9	10.8	177 34.3	26.9	59 53.6	41.4	79 26.1	133	16 42.4 -91	
9	304 14.2	353 15.6	29.1	267 04.7	11.4	192 36.8	26.9	74 56.1	41.4	93 58.4	133	-16 51.5 -91	
10	319 16.7	8 15.1	28.5	282 05.5	11.9	207 39.3	26.9	89 58.6	41.4	108 30.7	133	17 00.6 -89	
11	334 19.2	23 14.6	27.9	297 06.2	12.5	222 41.8	26.9	105 01.1	41.4	123 03.0	133	17 09.5 -89	
12	349 21.6	38 14.0	-17 27.3	312 07.0	+15 13.1	237 44.3	+22 26.9	120 03.6	-15 41.3	137 35.3	132	-17 18.4 -88	
13	4 24.1	53 13.5	26.7	327 07.8	13.7	252 46.8	26.9	135 06.1	41.3	152 07.5	132	17 27.2 -87	
14	19 26.5	68 13.0	26.1	342 08.6	14.2	267 49.3	26.9	150 08.6	41.3	166 39.7	131	17 35.9 -87	
15	34 29.0	83 12.4	25.5	357 09.3	14.8	282 51.8	26.9	165 11.1	41.3	181 11.8	132	-17 44.6 -85	
16	49 31.5	98 11.9	24.9	12 10.1	15.4	297 54.3	26.9	180 13.6	41.3	195 44.0	131	17 53.1 -85	
17	64 33.9	113 11.4	24.3	27 10.9	16.0	312 56.8	26.9	195 16.2	41.2	210 16.1	130	18 01.6 -84	
18	79 36.4	128 10.9	-17 23.7	42 11.6	+15 16.5	327 59.3	+22 26.9	210 18.7	-15 41.2	224 48.1	131	-18 10.0 -83	
19	94 38.9	143 10.3	23.1	57 12.4	17.1	343 01.8	26.9	225 21.2	41.2	239 20.2	130	18 18.3 -82	
20	109 41.3	158 09.8	22.5	72 13.2	17.7	358 04.3	26.9	240 23.7	41.2	253 52.2	129	18 26.5 -81	
21	124 43.8	173 09.3	21.9	87 13.9	18.2	13 06.8	27.0	255 26.2	41.2	268 24.1	130	-18 34.6 -81	
22	139 46.3	188 08.7	21.3	102 14.7	18.8	28 09.3	27.0	270 28.7	41.1	282 56.1	129	18 42.7 -79	
23	154 48.7	203 08.2	20.7	117 15.5	19.4	43 11.8	27.0	285 31.2	41.1	297 28.0	129	18 50.6 -79	
13	0	169 51.2	218 07.7	-17 20.1	132 16.2	+15 20.0	58 14.3	+22 27.0	300 33.7	-15 41.1	311 59.9	128	-18 58.5 -78
1	184 53.6	233 07.2	19.5	147 17.0	20.5	73 16.8	27.0	315 36.2	41.1	326 31.7	128	19 06.3 -77	
2	199 56.1	248 06.6	18.9	162 17.8	21.1	88 19.3	27.0	330 38.8	41.0	341 03.5	128	19 14.0 -76	
3	214 58.6	263 06.1	18.3	177 18.5	21.7	103 21.8	27.0	345 41.3	41.0	355 35.3	127	-19 21.6 -75	
4	230 01.0	278 05.6	17.7	192 19.3	22.2	118 24.3	27.0	0 43.8	41.0	10 07.0	127	19 29.1 -74	
5	245 03.5	293 05.1	17.1	207 20.1	22.8	133 26.8	27.0	15 46.3	41.0	24 38.7	127	19 36.5 -73	
6	260 06.0	308 04.5	-17 16.5	222 20.8	+15 23.4	148 29.3	+22 27.0	30 48.8	-15 41.0	39 10.4	127	-19 43.8 -73	
7	275 08.4	323 04.0	15.9	237 21.6	24.0	163 31.8	27.0	45 51.3	40.9	53 42.1	126	19 51.1 -71	
8	290 10.9	338 03.5	15.3	252 22.4	24.5	178 34.3	27.0	60 53.8	40.9	68 13.7	126	19 58.2 -71	
9	305 13.4	353 03.0	14.6	267 23.2	25.1	193 36.8	27.0	75 56.3	40.9	82 45.3	125	-20 05.3 -69	
10	320 15.8	8 02.4	14.0	282 23.9	25.7	208 39.3	27.0	90 58.9	40.9	97 16.8	125	20 12.2 -69	
11	335 18.3	23 01.9	13.4	297 24.7	26.2	223 41.8	27.0	106 01.4	40.9	111 48.3	125	20 19.1 -68	
12	350 20.8	38 01.4	-17 12.8	312 25.5	+15 26.8	238 44.2	+22 27.0	121 03.9	-15 40.8	126 19.8	125	-20 25.9 -67	
13	5 23.2	53 00.9	12.2	327 26.2	27.4	253 46.7	27.0	136 06.4	40.8	140 51.3	124	20 32.6 -65	
14	20 25.7	68 00.3	11.6	342 27.0	27.9	268 49.2	27.0	151 08.9	40.8	155 22.7	124	20 39.1 -65	
15	35 28.1	82 59.8	10.9	357 27.8	28.5	283 51.7	27.1	166 11.4	40.8	169 54.1	123	-20 45.6 -64	
16	50 30.6	97 59.3	10.3	12 28.5	29.1	298 54.2	27.1	181 13.9	40.8	184 25.4	123	20 52.0 -63	
17	65 33.1	112 58.8	9.7	27 29.3	29.6	313 56.7	27.1	196 16.4	40.7	198 56.7	123	20 58.3 -62	
18	80 35.5	127 58.2	-17 09.1	42 30.1	+15 30.2	328 59.2	+22 27.1	211 19.0	-15 40.7	213 28.0	123	-21 04.5 -61	
19	95 38.0	142 57.7	08.5	57 30.8	30.8	344 01.7	27.1	226 21.5	40.7	227 59.3	122	21 10.6 -60	
20	110 40.5	157 57.2	07.8	72 31.6	31.3	359 04.2	27.1	241 24.0	40.7	242 30.5	122	21 16.6 -60	
21	125 42.9	172 56.7	07.2	87 32.4	31.9	14 06.7	27.1	256 26.5	40.6	257 01.7	122	-21 22.6 -58	
22	140 45.4	187 56.1	06.6	102 33.1	32.5	29 09.2	27.1	271 29.0	40.6	271 32.9	121	21 28.4 -57	
23	155 47.9	202 55.6	06.0	117 33.9	33.0	44 11.6	27.1	286 31.5	40.6	286 04.0	121	21 34.1 -56	
24	170 50.3	217 55.1	-17 05.4	132 34.6	+15 33.6	59 14.1	+22 27.1	301 34.1	-15 40.6	300 35.1	121	-21 39.7 -55	
code	-												

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.	No.	Name	SHA	Dec.								Sun's Low'r Limb	Venus	Mars			
										11	12	13	14				Alt.	Add	Add
h	°	'	°	'	°	'	N	h	m	h	m	h	m	h	m	°	'	°	'
11	0	177 24.1	- 4 06.1	7	Acamar	315 51.6	-40 29.2	72	6 43	2 39	24 26	0 26	■	■	■	Alt.			
	1	192 24.3	05.1	5	Achernar	335 59.5	-57 27.9	70	6 40	3 05	23 46	26 16	2 16	■	■				
	2	207 24.4	04.2	30	Acrux	173 57.7	-62 51.2	68	6 37	3 25	23 19	25 13	1 13	■	■				
	3	222 24.6	.. 03.2	19	Adhara	255 46.7	-28 54.9	66	6 34	3 40	22 58	24 38	0 38	2 22	■				
	4	237 24.7	02.2	10	Aldebaran	291 39.6	+16 25.3	64	6 32	3 52	22 42	24 13	0 13	1 43	■				
	5	252 24.9	01.2					62	6 30	4 02	22 29	23 54	25 16	1 16	■				
	6	267 25.1	- 4 00.2	32	Alioth	166 58.3	+56 11.9	60	6 28	4 10	22 17	23 38	24 55	0 55	■				
	7	282 25.2	3 59.3	34	Alkaid	153 32.7	+49 31.8	58	6 27	4 16	22 08	23 25	24 38	0 38	■				
	8	297 25.4	58.3	55	Al Na'ir	28 38.8	-47 10.7	56	6 25	4 23	21 59	23 13	24 24	0 24	■				
	9	312 25.6	.. 57.3	15	Alnilam	276 30.6	- 1 13.8	54	6 24	4 28	21 52	23 03	24 12	0 12	■				
	10	327 25.7	56.3	25	Alphard	218 38.7	- 8 28.0	52	6 23	4 32	21 45	22 54	24 01	0 01	■				
	11	342 25.9	55.3					50	6 22	4 36	21 39	22 46	23 51	24 51	■				
	12	357 26.0	- 3 54.4	41	Alphecca	126 47.8	+26 51.5	45	6 20	4 43	21 26	22 29	23 31	24 29	■				
	13	12 26.2	53.4	1	Alpheratz	358 29.1	+28 50.6	40	6 18	4 49	21 15	22 15	23 14	24 11	■				
	14	27 26.4	52.4	51	Altair	62 51.0	+ 8 44.8	35	6 16	4 53	21 06	22 04	23 01	23 55	■				
	15	42 26.5	.. 51.4	2	Ankaa	353 59.0	-42 33.0	30	6 14	4 57	20 58	21 54	22 49	23 42	■				
	16	57 26.7	50.4	42	Antares	113 19.8	-26 20.1	20	6 12	5 00	20 44	21 36	22 28	23 20	■				
	17	72 26.9	49.5					10	6 09	5 00	20 32	21 21	22 11	23 00	■				
	18	87 27.0	- 3 48.5	37	Arcturus	146 35.3	+19 24.6	0	6 07	4 58	20 21	21 07	21 54	22 42	■				
	19	102 27.2	47.5	43	Atria	109 00.8	-68 56.7	10	6 04	4 54	20 10	20 53	21 38	22 24	■				
	20	117 27.4	46.5	22	Avior	234 35.5	-59 22.2	20	6 01	4 47	19 59	20 38	21 20	22 05	■				
	21	132 27.5	.. 45.5	13	Bellatrix	279 18.8	+ 6 18.6	30	5 58	4 36	19 45	20 21	21 00	21 43	■				
	22	147 27.7	44.5	16	Betelge'se	271 48.5	+ 7 24.0	35	5 56	4 29	19 38	20 11	20 49	21 30	■				
	23	162 27.9	43.6					40	5 54	4 21	19 29	20 00	20 35	21 15	■				
				17	Canopus	264 15.4	-52 40.5	45	5 51	4 09	19 19	19 47	20 19	20 58	■				
12	0	177 28.0	- 3 42.6	12	Capella	281 39.0	+45 57.5	50	5 48	3 53	19 07	19 31	20 00	20 36	■				
	1	192 28.2	41.6	53	Deneb	50 01.6	+45 07.0	52	5 46	3 45	19 01	19 24	19 51	20 25	■				
	2	207 28.4	40.6	28	Denebola	183 17.8	+14 49.1	54	5 44	3 37	18 55	19 15	19 41	20 13	■				
	3	222 28.5	.. 39.6	4	Diphda	349 39.9	-18 14.0	56	5 43	3 27	18 48	19 06	19 29	20 00	■				
	4	237 28.7	38.7					58	5 41	3 14	18 40	18 56	19 16	19 44	■				
	5	252 28.9	37.7	27	Dubhe	194 44.3	+61 59.5	60	5 38	3 01	18 32	18 44	19 01	19 26	■				
	6	267 29.0	- 3 36.7	14	Elnath	279 07.8	+28 34.4	S											
	7	282 29.2	35.7	47	Eltanin	91 06.5	+51 29.3		Lat.	Sunset	Twlt. ends	Moonset							
	8	297 29.4	34.7	54	Enif	34 30.3	+ 9 40.1		N.			11	12	13	14				
	9	312 29.5	.. 33.7	56	Fomalhaut	16 12.4	-29 51.6		h m	h m	h m	h m	h m	h m	h m				
	10	327 29.7	32.8					72	17 39	21 51	5 05	4 21	■	■	■				
	11	342 29.9	31.8	31	Gacrux	172 49.2	-56 51.9	70	17 42	21 22	5 26	5 02	4 08	■	■				
	12	357 30.0	- 3 30.8	29	Gienah	176 36.9	-17 17.8	68	17 45	21 02	5 43	5 30	5 12	■	■				
	13	12 30.2	29.8	35	Hadar	149 49.5	-60 09.5	66	17 48	20 46	5 56	5 52	5 47	5 41	■				
	14	27 30.4	28.8	6	Hamal	328 50.3	+23 15.2	64	17 50	20 34	6 07	6 09	6 13	6 21	■				
	15	42 30.5	.. 27.9	48	Kaus Aust.	84 41.8	-34 24.4	62	17 52	20 24	6 17	6 23	6 33	6 48	■				
	16	57 30.7	26.9					60	17 53	20 15	6 25	6 35	6 49	7 10	■				
	17	72 30.9	25.9	40	Kochab	137 17.1	+74 20.0	58	17 55	20 08	6 32	6 46	7 03	7 27	■				
	18	87 31.0	- 3 24.9	57	Markab	14 22.2	+14 57.8	56	17 56	20 01	6 39	6 55	7 15	7 42	■				
	19	102 31.2	23.9	8	Menkar	315 00.9	+ 3 54.9	54	17 57	19 56	6 45	7 03	7 26	7 54	■				
	20	117 31.4	22.9	36	Menkent	148 58.8	-36 09.1	52	17 58	19 51	6 50	7 10	7 35	8 06	■				
	21	132 31.5	.. 22.0	24	Miapl'dus	221 48.4	-69 32.2	50	17 59	19 47	6 55	7 17	7 43	8 15	■				
	22	147 31.7	21.0					45	18 01	19 39	7 05	7 31	8 01	8 36	■				
	23	162 31.9	20.0	9	Mirfak	309 43.2	+49 42.4	40	18 03	19 33	7 13	7 43	8 16	8 53	■				
				50	Nunki	76 52.5	-26 21.2	35	18 05	19 29	7 21	7 53	8 28	9 08	■				
				52	Peacock	54 28.2	-56 52.7	30	18 06	19 26	7 27	8 02	8 39	9 20	■				
				21	Pollux	244 20.8	+28 08.1	20	18 09	19 22	7 39	8 17	8 58	9 41	■				
				20	Procyon	245 45.2	+ 5 20.3	10	18 11	19 21	7 49	8 31	9 14	10 00	■				
								0	18 13	19 22	7 58	8 43	9 30	10 17	■				
				46	R'alhague	96 47.0	+12 35.2	10	18 16	19 26	8 08	8 56	9 45	10 35	■				
				26	Regulus	208 29.6	+12 11.0	20	18 18	19 32	8 18	9 09	10 01	10 53	■				
				11	Rigel	281 54.0	- 8 15.3	30	18 22	19 42	8 29	9 25	10 20	11 15	■				
				38	Rigel Kent.	140 51.1	-60 39.1	35	18 23	19 49	8 36	9 34	10 31	11 27	■				
				44	Sabik	103 02.6	-15 40.4	40	18 26	19 58	8 43	9 44	10 44	11 42	■				
								45	18 28	20 09	8 52	9 57	10 59	11 59	■				
				3	Schedar	350 31.0	+56 17.7	45	18 31	20 24	9 03	10 11	11 18	12 20	■				
				45	Shaula	97 21.2	-37 04.3	50	18 33	20 31	9 08	10 18	11 26	12 31	■				
				18	Sirius	259 12.1	-16 39.4	52	18 34	20 39	9 14	10 26	11 36	12 42	■				
				33	Spica	159 17.0	-10 55.9	54	18 36	20 49	9 20	10 35	11 47	12 55	■				
				23	Suhail	223 24.3	-43 15.3	56	18 38	21 01	9 27	10 45	12 00	13 11	■				
								58	18 40	21 14	9 34	10 56	12 15	13 29	■				
				49	Vega	81 08.6	+38 44.2	60											

G M T	VENUS -3.6		MARS 1.5		JUPITER -1.9		SATURN 0.6		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
h	°	'	°	'	°	'	°	'	°	'	°	'
14 0	170 50.3	217 55.1	-17 05.4	132 34.6	+15 33.6	59 14.1	+22 27.1	301 34.1	-15 40.6	300 35.1	121 -21 39.7	-55
1	185 52.8	232 54.6	04.7	147 35.4	34.2	74 16.6	27.1	316 36.6	40.6	315 06.2	120 21 45.2	-54
2	200 55.2	247 54.1	04.1	162 36.2	34.7	89 19.1	27.1	331 39.1	40.5	329 37.2	120 21 50.6	-53
3	215 57.7	262 53.5	.. 03.5	177 36.9	.. 35.3	104 21.6	.. 27.1	346 41.6	.. 40.5	344 08.2	120 -21 55.9	-52
4	231 00.2	277 53.0	02.8	192 37.7	35.9	119 24.1	27.1	1 44.1	40.5	358 39.2	119 22 01.1	-51
5	246 02.6	292 52.5	02.2	207 38.5	36.4	134 26.6	27.1	16 46.6	40.5	13 10.1	119 22 06.2	-50
6	261 05.1	307 52.0	-17 01.6	222 39.2	+15 37.0	149 29.1	+22 27.1	31 49.2	-15 40.5	27 41.0	119 -22 11.2	-49
7	276 07.6	322 51.5	01.0	237 40.0	37.6	164 31.5	27.1	46 51.7	40.4	42 11.9	119 22 16.1	-48
8	291 10.0	337 50.9	17 00.3	252 40.8	38.1	179 34.0	27.1	61 54.2	40.4	56 42.8	118 22 20.9	-47
9	306 12.5	352 50.4	-16 59.7	267 41.5	.. 38.7	194 36.5	.. 27.1	76 56.7	.. 40.4	71 13.6	118 -22 25.6	-46
10	321 15.0	7 49.9	59.1	282 42.3	39.3	209 39.0	27.1	91 59.2	40.4	85 44.4	117 22 30.2	-45
11	336 17.4	22 49.4	58.4	297 43.1	39.8	224 41.5	27.1	107 01.7	40.3	100 15.1	118 22 34.7	-44
12	351 19.9	37 48.9	-16 57.8	312 43.8	+15 40.4	239 44.0	+22 27.1	122 04.3	-15 40.3	114 45.9	117 -22 39.1	-43
13	6 22.4	52 48.3	57.2	327 44.6	41.0	254 46.5	27.2	137 06.8	40.3	129 16.6	117 22 43.4	-41
14	21 24.8	67 47.8	56.5	342 45.4	41.5	269 48.9	27.2	152 09.3	40.3	143 47.3	116 22 47.5	-41
15	36 27.3	82 47.3	.. 55.9	357 46.1	.. 42.1	284 51.4	.. 27.2	167 11.8	.. 40.3	158 17.9	116 -22 51.6	-40
16	51 29.7	97 46.8	55.2	12 46.9	42.6	299 53.9	27.2	182 14.3	40.2	172 48.5	116 22 55.6	-38
17	66 32.2	112 46.3	54.6	27 47.7	43.2	314 56.4	27.2	197 16.8	40.2	187 19.1	116 22 59.4	-38
18	81 34.7	127 45.7	-16 54.0	42 48.4	+15 43.8	329 58.9	+22 27.2	212 19.4	-15 40.2	201 49.7	116 -23 03.2	-36
19	96 37.1	142 45.2	53.3	57 49.2	44.3	345 01.4	27.2	227 21.9	40.2	216 20.3	115 23 06.8	-35
20	111 39.6	157 44.7	52.7	72 49.9	44.9	0 03.8	27.2	242 24.4	40.1	230 50.8	115 23 10.3	-35
21	126 42.1	172 44.2	.. 52.0	87 50.7	.. 45.5	15 06.3	.. 27.2	257 26.9	.. 40.1	245 21.3	114 -23 13.8	-33
22	141 44.5	187 43.7	51.4	102 51.5	46.0	30 08.8	27.2	272 29.4	40.1	259 51.7	115 23 17.1	-32
23	156 47.0	202 43.2	50.7	117 52.2	46.6	45 11.3	27.2	287 32.0	40.1	274 22.2	114 23 20.3	-31
15 0	171 49.5	217 42.6	-16 50.1	132 53.0	+15 47.1	60 13.8	+22 27.2	302 34.5	-15 40.1	288 52.6	114 -23 23.4	-30
1	186 51.9	232 42.1	49.5	147 53.8	47.7	75 16.2	27.2	317 37.0	40.0	303 23.0	114 23 26.4	-29
2	201 54.4	247 41.6	48.8	162 54.5	48.3	90 18.7	27.2	332 39.5	40.0	317 53.4	113 23 29.3	-27
3	216 56.9	262 41.1	.. 48.2	177 55.3	.. 48.8	105 21.2	.. 27.2	347 42.0	.. 40.0	332 23.7	113 -23 32.0	-27
4	231 59.3	277 40.6	47.5	192 56.0	49.4	120 23.7	27.2	2 44.6	40.0	346 54.0	113 23 34.7	-25
5	247 01.8	292 40.1	46.9	207 56.8	49.9	135 26.2	27.2	17 47.1	39.9	1 24.3	113 23 37.2	-25
6	262 04.2	307 39.5	-16 46.2	222 57.6	+15 50.5	150 28.6	+22 27.2	32 49.6	-15 39.9	15 54.6	113 -23 39.7	-23
7	277 06.7	322 39.0	45.6	237 58.3	51.0	165 31.1	27.2	47 52.1	39.9	30 24.9	112 23 42.0	-22
8	292 09.2	337 38.5	44.9	252 59.1	51.6	180 33.6	27.2	62 54.6	39.9	44 55.1	112 23 44.2	-21
9	307 11.6	352 38.0	.. 44.3	267 59.9	.. 52.2	195 36.1	.. 27.2	77 57.2	.. 39.8	59 25.3	112 -23 46.3	-20
10	322 14.1	7 37.5	43.6	283 00.6	52.7	210 38.5	27.2	92 59.7	39.8	73 55.5	112 23 48.3	-19
11	337 16.6	22 37.0	43.0	298 01.4	53.3	225 41.0	27.2	108 02.2	39.8	88 25.7	112 23 50.2	-18
12	352 19.0	37 36.4	-16 42.3	313 02.1	+15 53.8	240 43.5	+22 27.2	123 04.7	-15 39.8	102 55.9	111 -23 52.0	-16
13	7 21.5	52 35.9	41.6	328 02.9	54.4	255 46.0	27.2	138 07.2	39.8	117 26.0	111 23 53.6	-16
14	22 24.0	67 35.4	41.0	343 03.7	55.0	270 48.4	27.2	153 09.8	39.7	131 56.1	111 23 55.2	-14
15	37 26.4	82 34.9	.. 40.3	358 04.4	.. 55.5	285 50.9	.. 27.2	168 12.3	.. 39.7	146 26.2	111 -23 56.6	-13
16	52 28.9	97 34.4	39.7	13 05.2	56.1	300 53.4	27.2	183 14.8	39.7	160 56.3	111 23 57.9	-12
17	67 31.3	112 33.9	39.0	28 06.0	56.6	315 55.9	27.2	198 17.3	39.7	175 26.4	111 23 59.1	-11
18	82 33.8	127 33.4	-16 38.3	43 06.7	+15 57.2	330 58.3	+22 27.2	213 19.9	-15 39.6	189 56.5	110 -24 00.2	-10
19	97 36.3	142 32.9	37.7	58 07.5	57.7	346 00.8	27.3	228 22.4	39.6	204 26.5	110 24 01.2	-9
20	112 38.7	157 32.3	37.0	73 08.2	58.3	1 03.3	27.3	243 24.9	39.6	218 56.5	110 24 02.1	-7
21	127 41.2	172 31.8	.. 36.4	88 09.0	.. 58.8	16 05.8	.. 27.3	258 27.4	.. 39.6	233 26.5	110 -24 02.8	-7
22	142 43.7	187 31.3	35.7	103 09.8	15 59.4	31 08.2	27.3	273 29.9	39.5	247 56.5	110 24 03.5	-5
23	157 46.1	202 30.8	35.0	118 10.5	16 00.0	46 10.7	27.3	288 32.5	39.5	262 26.5	110 24 04.0	-4
16 0	172 48.6	217 30.3	-16 34.4	133 11.3	+16 00.5	61 13.2	+22 27.3	303 35.0	-15 39.5	276 56.5	110 -24 04.4	-3
1	187 51.1	232 29.8	33.7	148 12.0	01.1	76 15.7	27.3	318 37.5	39.5	291 26.5	109 24 04.7	-2
2	202 53.5	247 29.3	33.0	163 12.8	01.6	91 18.1	27.3	333 40.0	39.5	305 56.4	109 24 04.9	-1
3	217 56.0	262 28.8	.. 32.4	178 13.6	.. 02.2	106 20.6	.. 27.3	348 42.6	.. 39.4	320 26.4	109 -24 05.0	+1
4	232 58.5	277 28.2	31.7	193 14.3	02.7	121 23.1	27.3	3 45.1	39.4	334 56.3	109 24 04.9	+2
5	248 00.9	292 27.7	31.0	208 15.1	03.3	136 25.5	27.3	18 47.6	39.4	349 26.2	109 24 04.7	+2
6	263 03.4	307 27.2	-16 30.4	223 15.8	+16 03.8	151 28.0	+22 27.3	33 50.1	-15 39.4	3 56.1	109 -24 04.5	+4
7	278 05.8	322 26.7	29.7	238 16.6	04.4	166 30.5	27.3	48 52.7	39.3	18 26.0	109 24 04.1	+5
8	293 08.3	337 26.2	29.0	253 17.4	04.9	181 32.9	27.3	63 55.2	39.3	32 55.9	109 24 03.6	+7
9	308 10.8	352 25.7	.. 28.3	268 18.1	.. 05.5	196 35.4	.. 27.3	78 57.7	.. 39.3	47 25.8	109 -24 02.9	+7
10	323 13.2	7 25.2	27.7	283 18.9	06.0	211 37.9	27.3	94 00.2	39.3	61 55.7	109 24 02.2	+8
11	338 15.7	22 24.7	27.0	298 19.6	06.6	226 40.3	27.3	109 02.8	39.2	76 25.6	108 24 01.4	+10
12	353 18.2	37 24.2	-16 26.3	313 20.4	+16 07.1	241 42.8	+22 27.3	124 05.3	-15 39.2	90 55.4	109 -24 00.4	+11
13	8 20.6	52 23.7	25.7	328 21.2	07.7	256 45.3	27.3	139 07.8	39.2	105 25.3	108 23 59.3	+12
14	23 23.1	67 23.2	25.0	343 21.9	08.2	271 47.7	27.3	154 10.3	39.2	119 55.2	108 23 58.1	+13
15	38 25.6	82 22.6	.. 24.3	358 22.7	.. 08.8	286 50.2	.. 27.3	169 12.9	.. 39.1	134 25.0	109 -23 56.8	+14
16	53 28.0	97 22.1	23.6	13 23.4	09.3	301 52.7	27.3	184 15.4	39.1	148 54.9	108 23 55.4	+16
17	68 30.5	112 21.6	22.9	28 24.2	09.9	316 55.1	27.3	199 17.9	39.1	163 24.7	109 23 53.8	+16
18	83 33.0	127 21.1	-16 22.3	43 25.0	+16 10.4	331 57.6	+22 27.3	214 20.5	-15 39.1	177 54.6	108 -23 52.2	+18
19	98 35.4	142 20.6	21.6	58 25.7	11.0	347 00.1	27.3	229 23.0	39.0	192 24.4	108 23 50.4	+19
20	113 37.9	157 20.1	20.9	73 26.5	11.5	2 02.5	27.3	244 25.5	39.0	206 54.2	109 23 48.5	+20
21	128 40.3	172 19.6	.. 20.2	88 27.2	.. 12.1	17 05.0	.. 27.3	259 28.0	.. 39.0	221 24.1	108 -23 46.5	+21
22	143 42.8	187 19.1	19.5	103 28.0	12.6	32 07.5	27.3	274 30.6	39.0	235 53.9	109 23 44.4	+23
23	158 45.3	202 18.6	18.8	118 28.8	13.2	47 09.9	27.3	289 33.1	38.9	250 23.8	108 23 42.1	+23
24	173 47.7	217 18.1	-16 18.2	133 29.5	+16 13.7	62 12.4	+22 27.3	304 35.6	-15 38.9	264 53.6	109 -23 39.8	+25
code	-	- 5	+ 7	+ 8</								

G M T	VENUS -3.6				MARS 1.6				JUPITER -1.9				SATURN 0.5				MOON			
	GHA	GHA	Dec		GHA	Dec			GHA	Dec			GHA	Dec			GHA	code	Dec.	code
17	0 173 47.7	217 18.1	-16 18.2		133 29.5	+16 13.7			62 12.4	+22 27.3			304 35.6	-15 38.9			264 53.6	109	-23 39.8	+ 25
1	188 50.2	232 17.6	17.5		148 30.3	14.3			77 14.9	27.3			319 38.1	38.9			279 23.5	108	23 37.3	+ 26
2	203 52.7	247 17.1	16.8		163 31.0	14.8			92 17.3	27.3			334 40.7	38.9			293 53.3	109	23 34.7	+ 27
3	218 55.1	262 16.6	16.1		178 31.8	15.4			107 19.8	27.3			349 43.2	38.8			308 23.2	108	23 32.0	+ 28
4	233 57.6	277 16.1	15.4		193 32.5	15.9			122 22.2	27.3			4 45.7	38.8			322 53.0	109	23 29.2	+ 29
5	249 00.1	292 15.6	14.7		208 33.3	16.5			137 24.7	27.3			19 48.3	38.8			337 22.9	108	23 26.3	+ 31
6	264 02.5	307 15.1	-16 14.0		223 34.1	+16 17.0			152 27.2	+22 27.3			34 50.8	-15 38.8			351 52.7	109	-23 23.2	+ 31
7	279 05.0	322 14.5	13.3		238 34.8	17.6			167 29.6	27.3			49 53.3	38.7			6 22.6	109	23 20.1	+ 33
8	294 07.5	337 14.0	12.7		253 35.6	18.1			182 32.1	27.3			64 55.8	38.7			20 52.5	108	23 16.8	+ 34
9	309 09.9	352 13.5	12.0		268 36.3	18.7			197 34.5	27.3			79 58.4	38.7			35 22.3	109	23 13.4	+ 35
10	324 12.4	7 13.0	11.3		283 37.1	19.2			212 37.0	27.3			95 00.9	38.7			49 52.2	109	23 09.9	+ 36
11	339 14.8	22 12.5	10.6		298 37.9	19.8			227 39.5	27.3			110 03.4	38.6			64 22.1	109	23 06.3	+ 37
12	354 17.3	37 12.0	-16 09.9		313 38.6	+16 20.3			242 41.9	+22 27.3			125 06.0	-15 38.6			78 52.0	109	-23 02.6	+ 39
13	9 19.8	52 11.5	09.2		328 39.4	20.9			257 44.4	27.3			140 08.5	38.6			93 21.9	109	22 58.7	+ 39
14	24 22.2	67 11.0	08.5		343 40.1	21.4			272 46.8	27.3			155 11.0	38.6			107 51.8	109	22 54.8	+ 41
15	39 24.7	82 10.5	07.8		358 40.9	21.9			287 49.3	27.3			170 13.6	38.5			122 21.7	109	22 50.7	+ 42
16	54 27.2	97 10.0	07.1		13 41.6	22.5			302 51.8	27.3			185 16.1	38.5			136 51.6	110	22 46.5	+ 43
17	69 29.6	112 09.5	06.4		28 42.4	23.0			317 54.2	27.3			200 18.6	38.5			151 21.6	109	22 42.2	+ 44
18	84 32.1	127 09.0	-16 05.7		43 43.2	+16 23.6			332 56.7	+22 27.3			215 21.1	-15 38.5			165 51.5	110	-22 37.8	+ 45
19	99 34.6	142 08.5	05.0		58 43.9	24.1			347 59.1	27.3			230 23.7	38.4			180 21.5	109	22 33.3	+ 46
20	114 37.0	157 08.0	04.3		73 44.7	24.7			3 01.6	27.3			245 26.2	38.4			194 51.4	110	22 28.7	+ 48
21	129 39.5	172 07.5	03.6		88 45.4	25.2			18 04.0	27.3			260 28.7	38.4			209 21.4	110	22 23.9	+ 48
22	144 41.9	187 07.0	02.9		103 46.2	25.8			33 06.5	27.3			275 31.3	38.4			223 51.4	110	22 19.1	+ 50
23	159 44.4	202 06.5	02.2		118 46.9	26.3			48 08.9	27.3			290 33.8	38.3			238 21.4	110	22 14.1	+ 51
18	0 174 46.9	217 06.0	-16 01.5		133 47.7	+16 26.8			63 11.4	+22 27.3			305 36.3	-15 38.3			252 51.4	110	-22 09.0	+ 51
1	189 49.3	232 05.5	00.8		148 48.4	27.4			78 13.9	27.3			320 38.9	38.3			267 21.4	111	22 03.9	+ 54
2	204 51.8	247 05.0	16 00.1		163 49.2	27.9			93 16.3	27.3			335 41.4	38.3			281 51.5	110	21 58.5	+ 54
3	219 54.3	262 04.5	-15 59.4		178 50.0	28.5			108 18.8	27.3			350 43.9	38.2			296 21.5	111	21 53.1	+ 55
4	234 56.7	277 04.0	58.7		193 50.7	29.0			123 21.2	27.3			5 46.5	38.2			310 51.6	110	21 47.6	+ 56
5	249 59.2	292 03.5	58.0		208 51.5	29.5			138 23.7	27.3			20 49.0	38.2			325 21.6	111	21 42.0	+ 58
6	265 01.7	307 03.0	-15 57.3		223 52.2	+16 30.1			153 26.1	+22 27.3			35 51.5	-15 38.2			339 51.7	111	-21 36.2	+ 58
7	280 04.1	322 02.5	56.5		238 53.0	30.6			168 28.6	27.3			50 54.1	38.1			354 21.8	111	21 30.4	+ 60
8	295 06.6	337 02.0	55.8		253 53.7	31.2			183 31.0	27.3			65 56.6	38.1			8 51.9	112	21 24.4	+ 60
9	310 09.1	352 01.5	55.1		268 54.5	31.7			198 33.5	27.3			80 59.1	38.1			23 22.1	111	21 18.4	+ 62
10	325 11.5	7 01.0	54.4		283 55.2	32.2			213 35.9	27.3			96 01.7	38.1			37 52.2	112	21 12.2	+ 63
11	340 14.0	22 00.5	53.7		298 56.0	32.8			228 38.4	27.3			111 04.2	38.0			52 22.4	111	21 05.9	+ 64
12	355 16.4	37 00.0	-15 53.0		313 56.7	+16 33.3			243 40.8	+22 27.3			126 06.7	-15 38.0			66 52.5	112	-20 59.5	+ 65
13	10 18.9	51 59.5	52.3		328 57.5	33.9			258 43.3	27.3			141 09.3	38.0			81 22.7	112	20 53.0	+ 66
14	25 21.4	66 59.0	51.6		343 58.3	34.4			273 45.7	27.3			156 11.8	38.0			95 52.9	113	20 46.4	+ 67
15	40 23.8	81 58.5	50.8		358 59.0	34.9			288 48.2	27.3			171 14.3	37.9			110 23.2	112	20 39.7	+ 68
16	55 26.3	96 58.0	50.1		13 59.8	35.5			303 50.6	27.3			186 16.9	37.9			124 53.4	112	20 32.9	+ 70
17	70 28.8	111 57.5	49.4		29 00.5	36.0			318 53.1	27.3			201 19.4	37.9			139 23.6	113	20 25.9	+ 70
18	85 31.2	126 57.0	-15 48.7		44 01.3	+16 36.6			333 55.5	+22 27.3			216 21.9	-15 37.9			153 53.9	113	-20 18.9	+ 71
19	100 33.7	141 56.5	48.0		59 02.0	37.1			348 58.0	27.3			231 24.5	37.8			168 24.2	113	20 11.8	+ 73
20	115 36.2	156 56.1	47.2		74 02.8	37.6			4 00.4	27.3			246 27.0	37.8			182 54.5	113	20 04.5	+ 73
21	130 38.6	171 55.6	46.5		89 03.5	38.2			19 02.9	27.3			261 29.5	37.7			197 24.8	113	19 57.2	+ 75
22	145 41.1	186 55.1	45.8		104 04.3	38.7			34 05.3	27.3			276 32.1	37.7			211 55.1	114	19 49.7	+ 75
23	160 43.6	201 54.6	45.1		119 05.0	39.2			49 07.7	27.3			291 34.6	37.7			226 25.5	114	19 42.2	+ 77
19	0 175 46.0	216 54.1	-15 44.4		134 05.8	+16 39.8			64 10.2	+22 27.3			306 37.1	-15 37.7			240 55.9	113	-19 34.5	+ 78
1	190 48.5	231 53.6	43.6		149 06.5	40.3			79 12.6	27.3			321 39.7	37.7			255 26.2	114	19 26.7	+ 78
2	205 50.9	246 53.1	42.9		164 07.3	40.9			94 15.1	27.3			336 42.2	37.6			269 56.6	115	19 18.9	+ 80
3	220 53.4	261 52.6	42.2		179 08.1	41.4			109 17.5	27.3			351 44.7	37.6			284 27.1	114	19 10.9	+ 81
4	235 55.9	276 52.1	41.5		194 08.8	41.9			124 20.0	27.3			6 47.3	37.6			298 57.5	114	19 02.8	+ 81
5	250 58.3	291 51.6	40.7		209 09.6	42.5			139 22.4	27.3			21 49.8	37.6			313 27.9	115	18 54.7	+ 83
6	266 00.8	306 51.1	-15 40.0		224 10.3	+16 43.0			154 24.9	+22 27.3			36 52.4	-15 37.5			327 58.4	115	-18 46.4	+ 84
7	281 03.3	321 50.6	39.3		239 11.1	43.5			169 27.3	27.3			51 54.9	37.5			342 28.9	115	18 38.0	+ 84
8	296 05.7	336 50.1	38.5		254 11.8	44.1			184 29.7	27.3			66 57.4	37.5			356 59.4	115	18 29.6	+ 86
9	311 08.2	351 49.6	37.8		269 12.6	44.6			199 32.2	27.3			82 00.0	37.5			11 29.9	115	18 21.0	+ 87
10	326 10.7	6 49.1	37.1		284 13.3	45.1			214 34.6	27.3			97 02.5	37.4			26 00.4	116	18 12.3	+ 87
11	341 13.1	21 48.6	36.4		299 14.1	45.7			229 37.1	27.3			112 05.0	37.4			40 31.0	116	18 03.6	+ 89
12	356 15.6	36 48.2	-15 35.6		314 14.8	+16 46.2			244 39.5	+22 27.3			127 07.6	-15 37.4			55 01.6	116	-17 54.7	+ 89
13	11 18.0	51 47.7	34.9		329 15.6	46.7			259 42.0	27.3			142 10.1	37.3			69 32.2	116	17 45.8	+ 91
14	26 20.5	66 47.2	34.2		344 16.3	47.3			274 44.4	27.3			157 12.7	37.3			84 02.8	116	17 36.7	+ 91
15	41 23.0	81 46.7	33.4		359 17.1	47.8			289 46.8	27.3			172 15.2	37.3			98 33.4	116	17 27.6	+ 93
16	56 25.4	96 46.2	32.7		14 17.8	48.3			304 49.3	27.3			187 17.7	37.3			113 04.0	116	17 18.3	+ 93
17</																				

G M T	SUN			STARS			Lat.	Sunrise	Twilt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS						
	GHA	Dec.	No.	Name	SHA	Dec.				17	18	19	20	Moon's Lower Limb						
														Add						
h	°	'	°	°	'	"	N	h	m	h	m	h	m	h	m	Alt.	Sun's Low'r Limb	Venus	Mars	
17	0	177 48.8	- 1 44.4	7	Acamar	315 51.6	-40 29.2	72	6 12	1 38	■	■	■	6 38	Alt.	0	'	'	'	
1	192	48.9	43.4	5	Achernar	335 59.6	-57 27.9	70	6 12	2 23	■	■	6 46	6 06	Add	30	0.4	0.1	0.1	
2	207	49.1	42.4	30	Acrux	173 57.6	-62 51.2	68	6 11	2 51	■	6 39	5 59	5 43	Add	45	0.4	0.1	0.0	
3	222	49.3	41.4	19	Adhara	255 46.7	-28 54.9	66	6 11	3 11	5 42	5 34	5 29	5 25	Add	60	0.4	0.1	0.0	
4	237	49.5	40.4	10	Aldebaran	291 39.6	+16 25.3	64	6 11	3 26	4 43	4 59	5 06	5 09	Add	75	0.4	0.1	0.0	
5	252	49.6	39.4					62	6 10	3 39	4 09	4 34	4 48	4 57	Add	90	0.4	0.0	0.0	
6	267	49.8	- 1 38.4	32	Alioth	166 58.3	+56 11.9	60	6 10	3 49	3 45	4 13	4 33	4 46	Add					
7	282	50.0	37.4	34	Alkaid	153 32.7	+49 31.9	58	6 10	3 58	3 25	3 57	4 20	4 37	Add					
8	297	50.2	36.5	55	Al Na'ir	28 38.8	-47 10.6	56	6 10	4 05	3 09	3 43	4 08	4 29	Add					
9	312	50.4	35.5	15	Alnilam	276 30.7	- 1 13.9	54	6 09	4 12	2 55	3 30	3 59	4 21	Add					
10	327	50.5	34.5	25	Alphard	218 38.7	- 8 28.1	52	6 09	4 17	2 42	3 20	3 50	4 15	Add					
11	342	50.7	33.5					50	6 09	4 22	2 31	3 10	3 42	4 09	Add					
12	357	50.9	- 1 32.5	41	Alphecca	126 47.7	+26 51.5	45	6 08	4 32	2 09	2 50	3 25	3 56	Add					
13	12	51.1	31.5	1	Alpheratz	358 29.1	+28 50.6	40	6 08	4 39	1 51	2 33	3 11	3 45	Add					
14	27	51.3	30.5	51	Altair	62 50.9	+ 8 44.8	35	6 08	4 45	1 35	2 19	2 59	3 36	Add					
15	42	51.4	29.5	2	Ankaa	353 59.0	-42 33.0	30	6 07	4 49	1 22	2 07	2 49	3 27	Add					
16	57	51.6	28.6	42	Antares	113 19.7	-26 20.1	20	6 07	4 54	1 00	1 47	2 31	3 13	Add					
17	72	51.8	27.6					10	6 06	4 56	0 40	1 28	2 15	3 01	Add					
18	87	52.0	- 1 26.6	37	Arcturus	146 35.2	+19 24.6	0	6 05	4 56	0 22	1 11	2 01	2 49	Add					
19	102	52.2	25.6	43	Atria	109 00.7	-68 56.7	10	6 04	4 54	0 03	0 54	1 46	2 38	Add					
20	117	52.3	24.6	22	Avior	234 35.6	-59 22.2	20	6 03	4 50	24 36	0 36	1 30	2 25	Add					
21	132	52.5	23.6	13	Bellatrix	279 18.9	+ 6 18.6	30	6 01	4 41	24 15	0 15	1 12	2 11	Add					
22	147	52.7	22.6	16	Betelge'se	271 48.5	+ 7 23.9	35	6 01	4 35	24 03	0 03	1 02	2 03	Add					
23	162	52.9	21.6					40	6 00	4 28	23 49	24 50	0 50	1 53	Add					
				17	Canopus	264 15.5	-52 40.5	45	5 59	4 18	23 32	24 35	0 35	1 42	Add					
18	0	177 53.1	- 1 20.6	12	Capella	281 39.0	+45 57.4	50	5 57	4 05	23 11	24 18	0 18	1 28	Add					
1	192	53.2	19.7	53	Deneb	50 01.6	+45 07.0	52	5 56	3 59	23 01	24 09	0 09	1 22	Add					
2	207	53.4	18.7	28	Denebola	183 17.8	+14 49.1	54	5 56	3 52	22 50	24 00	0 00	1 15	Add					
3	222	53.6	17.7	4	Diphda	349 39.9	-18 14.0	56	5 55	3 43	22 37	23 49	25 07	1 07	Add					
4	237	53.8	16.7					58	5 54	3 34	22 23	23 37	24 58	0 58	Add					
5	252	54.0	15.7	27	Dubhe	194 44.3	+61 59.5	60	5 53	3 21	22 05	23 23	24 48	0 48	Add					
6	267	54.1	- 1 14.7	14	Elnath	279 07.8	+28 34.4	S							Add					
7	282	54.3	13.7	47	Eltanin	91 06.4	+51 29.3		Lat.	Sunset	Twilt. ends	Moonset				64				
8	297	54.5	12.7	54	Enif	34 30.2	+ 9 40.1		N	h	m	h	m	h	m	72				
9	312	54.7	11.7	56	Fomalhaut	16 12.4	-29 51.6					17	18	19	20	76				
10	327	54.9	10.8					72	18 07	22 56	■	■	■	11 44	80					
11	342	55.1	09.8	31	Gacrux	172 49.2	-56 51.9	70	18 07	22 05	■	■	9 54	12 14	84					
12	357	55.2	- 1 08.8	29	Gienah	176 36.9	-17 17.8	68	18 07	21 35	■	8 17	10 39	12 37	88					
13	12	55.4	07.8	35	Hadar	149 49.5	-60 09.5	66	18 07	21 13	7 30	9 21	11 09	12 54	90					
14	27	55.6	06.8	6	Hamal	328 50.4	+23 15.1	64	18 08	20 57	8 28	9 56	11 31	13 08						
15	42	55.8	05.8	48	Kaus Aust.	84 41.7	-34 24.4	62	18 08	20 44	9 02	10 21	11 48	13 19						
16	57	56.0	04.8					60	18 08	20 33	9 27	10 41	12 03	13 29						
17	72	56.1	03.8	40	Kochab	137 17.0	+74 20.0	58	18 08	20 23	9 46	10 57	12 15	13 38						
18	87	56.3	- 1 02.9	57	Markab	14 22.2	+14 57.8	56	18 08	20 15	10 02	11 10	12 26	13 45						
19	102	56.5	01.9	8	Menkar	315 00.9	+ 3 54.9	54	18 08	20 09	10 16	11 22	12 35	13 52						
20	117	56.7	1 00.9	36	Menkent	148 58.8	-36 09.1	52	18 08	20 03	10 28	11 33	12 43	13 58						
21	132	56.9	0 59.9	24	Miapl'dus	221 48.5	-69 32.3	50	18 09	19 58	10 39	11 42	12 51	14 03						
22	147	57.1	58.9					45	18 09	19 48	11 01	12 02	13 07	14 15						
23	162	57.2	57.9	9	Mirfak	309 43.2	+49 42.4	40	18 09	19 40	11 19	12 18	13 20	14 24						
				50	Nunki	76 52.4	-26 21.2	35	18 10	19 34	11 34	12 31	13 31	14 33						
19	0	177 57.4	- 0 56.9	52	Peacock	54 28.2	-56 52.6	30	18 10	19 30	11 47	12 42	13 40	14 40						
1	192	57.6	55.9	21	Pollux	244 20.9	+28 08.1	20	18 10	19 23	12 09	13 02	13 57	14 52						
2	207	57.8	54.9	20	Procyon	245 45.2	+ 5 20.3	10	18 11	19 21	12 28	13 19	14 11	15 03						
3	222	58.0	54.0					0	18 12	19 21	12 46	13 35	14 24	15 12						
4	237	58.2	53.0	46	R'alhague	96 46.9	+12 35.2	10	18 12	19 22	13 03	13 51	14 37	15 22						
5	252	58.3	52.0	26	Regulus	208 29.6	+12 11.0	20	18 13	19 26	13 22	14 08	14 51	15 33						
6	267	58.5	- 0 51.0	11	Rigel	281 54.0	- 8 15.3	30	18 15	19 35	13 44	14 27	15 07	15 45						
7	282	58.7	50.0	38	Rigel Kent.	140 51.1	-60 39.1	35	18 15	19 40	13 57	14 39	15 16	15 51						
8	297	58.9	49.0	44	Sabik	103 02.5	-15 40.4	40	18 16	19 47	14 11	14 51	15 27	15 59						
9	312	59.1	48.0					45	18 17	19 56	14 29	15 06	15 39	16 08						
10	327	59.2	47.0	3	Schedar	350 31.0	+56 17.6	50	18 18	20 08	14 50	15 25	15 54	16 19						
11	342	59.4	46.0	45	Shaula	97 21.2	-37 04.3	52	18 19	20 15	15 00	15 34	16 01	16 24						
12	357	59.6	- 0 45.1	18	Sirius	259 12.1	-16 39.4	54	18 20	20 22	15 12	15 43	16 08	16 29						
13	12	59.8	44.1	33	Spica	159 17.0	-10 55.9	56	18 20	20 29	15 25	15 54	16 17	16 35						
14	28	00.0	43.1	23	Suhail	223 24.3	-43 15.4	58	18 21	20 39	15 40	16 07	16 27	16 42						
15	43	00.2	42.1					60	18 22	20 50	15 58	16 21	16 38	16 49						
16	58	00.3	41.1	49	Vega	81 08.6	+38 44.2	S												
17	73	00.5	40.1	39	Zub'g'bi															

G M T	T GHA	VENUS -3.6		MARS 1.6		JUPITER -1.9		SATURN 0.5		MOON			
		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
20	0	176 45.2	216 42.3	-15 26.8	134 23.8	+16 52.6	65 08.8	+22 27.2	307 38.0	-15 37.1	229 09.6	118 -16 01.1	+101
	1	191 47.6	231 41.8	26.0	149 24.6	53.1	80 11.2	27.2	322 40.6	37.0	243 40.4	118 15 51.0	+102
	2	206 50.1	246 41.3	25.3	164 25.3	53.6	95 13.7	27.2	337 43.1	37.0	258 11.2	118 15 40.8	+102
	3	221 52.5	261 40.8	24.5	179 26.1	54.2	110 16.1	27.2	352 45.7	37.0	272 42.0	118 15 30.6	+103
	4	236 55.0	276 40.3	23.8	194 26.8	54.7	125 18.5	27.2	7 48.2	36.9	287 12.8	118 15 20.3	+105
	5	251 57.5	291 39.8	23.1	209 27.6	55.2	140 21.0	27.2	22 50.7	36.9	301 43.6	118 15 09.8	+105
	6	266 59.9	306 39.4	-15 22.3	224 28.3	+16 55.8	155 23.4	+22 27.2	37 53.3	-15 36.9	316 14.4	119 -14 59.3	+106
	7	282 02.4	321 38.9	21.6	239 29.1	56.3	170 25.8	27.2	52 55.8	36.9	330 45.3	118 14 48.7	+106
	8	297 04.9	336 38.4	20.8	254 29.8	56.8	185 28.3	27.2	67 58.4	36.8	345 16.1	119 14 38.1	+108
	9	312 07.3	351 37.9	20.1	269 30.6	57.4	200 30.7	27.2	83 00.9	36.8	359 47.0	119 14 27.3	+108
	10	327 09.8	6 37.4	19.3	284 31.3	57.9	215 33.1	27.2	98 03.5	36.8	14 17.9	119 14 16.5	+110
	11	342 12.3	21 36.9	18.6	299 32.1	58.4	230 35.6	27.2	113 06.0	36.7	28 48.8	119 14 05.5	+110
	12	357 14.7	36 36.4	-15 17.8	314 32.8	+16 58.9	245 38.0	+22 27.2	128 08.5	-15 36.7	43 19.7	119 -13 54.5	+111
	13	12 17.2	51 36.0	17.1	329 33.6	16 59.5	260 40.4	27.2	143 11.1	36.7	57 50.6	120 13 43.4	+111
	14	27 19.7	66 35.5	16.3	344 34.3	17 00.0	275 42.9	27.2	158 13.6	36.7	72 21.6	119 13 32.3	+113
	15	42 22.1	81 35.0	15.6	359 35.1	00.5	290 45.3	27.2	173 16.2	36.6	86 52.5	119 13 21.0	+113
	16	57 24.6	96 34.5	14.8	14 35.8	01.0	305 47.7	27.2	188 18.7	36.6	101 23.4	120 13 09.7	+114
	17	72 27.0	111 34.0	14.1	29 36.6	01.6	320 50.2	27.2	203 21.2	36.6	115 54.4	119 12 58.3	+115
	18	87 29.5	126 33.5	-15 13.3	44 37.3	+17 02.1	335 52.6	+22 27.2	218 23.8	-15 36.6	130 25.3	120 -12 46.8	+116
	19	102 32.0	141 33.1	12.5	59 38.1	02.6	350 55.0	27.2	233 26.3	36.5	144 56.3	120 12 35.2	+116
	20	117 34.4	156 32.6	11.8	74 38.8	03.1	5 57.4	27.2	248 28.9	36.5	159 27.3	120 12 23.6	+117
	21	132 36.9	171 32.1	11.0	89 39.6	03.7	20 59.9	27.2	263 31.4	36.5	173 58.3	120 12 11.9	+118
	22	147 39.4	186 31.6	10.3	104 40.3	04.2	36 02.3	27.2	278 34.0	36.4	188 29.3	120 12 00.1	+119
	23	162 41.8	201 31.1	09.5	119 41.1	04.7	51 04.7	27.2	293 36.5	36.4	203 00.3	120 11 48.2	+119
21	0	177 44.3	216 30.6	-15 08.7	134 41.8	+17 05.2	66 07.2	+22 27.2	308 39.0	-15 36.4	217 31.3	120 -11 36.3	+120
	1	192 46.8	231 30.2	08.0	149 42.6	05.8	81 09.6	27.2	323 41.6	36.4	232 02.3	120 11 24.3	+121
	2	207 49.2	246 29.7	07.2	164 43.3	06.3	96 12.0	27.2	338 44.1	36.3	246 33.3	120 11 12.2	+121
	3	222 51.7	261 29.2	06.5	179 44.1	06.8	111 14.4	27.1	353 46.7	36.3	261 04.3	120 11 00.1	+122
	4	237 54.1	276 28.7	05.7	194 44.8	07.3	126 16.9	27.1	8 49.2	36.3	275 35.3	120 10 47.9	+123
	5	252 56.6	291 28.2	04.9	209 45.6	07.9	141 19.3	27.1	23 51.8	36.2	290 06.3	120 10 35.6	+124
	6	267 59.1	306 27.8	-15 04.2	224 46.3	+17 08.4	156 21.7	+22 27.1	38 54.3	-15 36.2	304 37.3	121 -10 23.2	+124
	7	283 01.5	321 27.3	03.4	239 47.1	08.9	171 24.1	27.1	53 56.9	36.2	319 08.4	120 10 10.8	+125
	8	298 04.0	336 26.8	02.6	254 47.8	09.4	186 26.6	27.1	68 59.4	36.2	333 39.4	120 9 58.3	+125
	9	313 06.5	351 26.3	01.9	269 48.6	10.0	201 29.0	27.1	84 01.9	36.1	348 10.4	120 9 45.8	+126
	10	328 08.9	6 25.8	01.1	284 49.3	10.5	216 31.4	27.1	99 04.5	36.1	2 41.4	120 9 33.2	+127
	11	343 11.4	21 25.4	15 00.3	299 50.0	11.0	231 33.8	27.1	114 07.0	36.1	17 12.4	121 9 20.5	+127
	12	358 13.9	36 24.9	-14 59.6	314 50.8	+17 11.5	246 36.3	+22 27.1	129 09.6	-15 36.0	31 43.5	120 -9 07.8	+128
	13	13 16.3	51 24.4	58.8	329 51.5	12.0	261 38.7	27.1	144 12.1	36.0	46 14.5	120 8 55.0	+129
	14	28 18.8	66 23.9	58.0	344 52.3	12.6	276 41.1	27.1	159 14.7	36.0	60 45.5	120 8 42.1	+129
	15	43 21.3	81 23.4	57.3	359 53.0	13.1	291 43.5	27.1	174 17.2	36.0	75 16.5	120 8 29.2	+130
	16	58 23.7	96 23.0	56.5	14 53.8	13.6	306 46.0	27.1	189 19.8	35.9	89 47.5	120 8 16.2	+130
	17	73 26.2	111 22.5	55.7	29 54.5	14.1	321 48.4	27.1	204 22.3	35.9	104 18.5	120 8 03.2	+131
	18	88 28.6	126 22.0	-14 54.9	44 55.3	+17 14.6	336 50.8	+22 27.1	219 24.9	-15 35.9	118 49.5	120 -7 50.1	+131
	19	103 31.1	141 21.5	54.2	59 56.0	15.2	351 53.2	27.1	234 27.4	35.8	133 20.5	120 7 37.0	+132
	20	118 33.6	156 21.1	53.4	74 56.8	15.7	6 55.7	27.1	249 29.9	35.8	147 51.5	119 7 23.8	+133
	21	133 36.0	171 20.6	52.6	89 57.5	16.2	21 58.1	27.1	264 32.5	35.8	162 22.4	120 7 10.5	+133
	22	148 38.5	186 20.1	51.8	104 58.3	16.7	37 00.5	27.1	279 35.0	35.8	176 53.4	119 6 57.2	+133
	23	163 40.1	201 19.6	51.1	119 59.0	17.2	52 02.9	27.1	294 37.6	35.7	191 24.3	120 6 43.9	+134
22	0	178 43.4	216 19.2	-14 50.3	134 59.7	+17 17.8	67 05.3	+22 27.0	309 40.1	-15 35.7	205 55.3	119 -6 30.5	+135
	1	193 45.9	231 18.7	49.5	150 00.5	18.3	82 07.8	27.0	324 42.7	35.7	220 26.2	119 6 17.0	+135
	2	208 48.4	246 18.2	48.7	165 01.2	18.8	97 10.2	27.0	339 45.2	35.6	234 57.1	120 6 03.5	+135
	3	223 50.8	261 17.7	48.0	180 02.0	19.3	112 12.6	27.0	354 47.8	35.6	249 28.1	118 5 50.0	+136
	4	238 53.3	276 17.3	47.2	195 02.7	19.8	127 15.0	27.0	9 50.3	35.6	263 58.9	119 5 36.4	+136
	5	253 55.8	291 16.8	46.4	210 03.5	20.3	142 17.4	27.0	24 52.9	35.5	278 29.8	119 5 22.8	+137
	6	268 58.2	306 16.3	-14 45.6	225 04.2	+17 20.9	157 19.8	+22 27.0	39 55.4	-15 35.5	293 00.7	119 -5 09.1	+137
	7	284 00.7	321 15.8	44.8	240 05.0	21.4	172 22.3	27.0	54 58.0	35.5	307 31.6	118 4 55.4	+138
	8	299 03.1	336 15.4	44.0	255 05.7	21.9	187 24.7	27.0	70 00.5	35.5	322 02.4	118 4 41.6	+138
	9	314 05.6	351 14.9	43.3	270 06.5	22.4	202 27.1	27.0	85 03.1	35.4	336 33.2	118 4 27.8	+138
	10	329 08.1	6 14.4	42.5	285 07.2	22.9	217 29.5	27.0	100 05.6	35.4	351 04.0	118 4 14.0	+139
	11	344 10.5	21 13.9	41.7	300 07.9	23.4	232 31.9	27.0	115 08.2	35.4	5 34.8	118 4 00.1	+139
	12	359 13.0	36 13.5	-14 40.9	315 08.7	+17 23.9	247 34.3	+22 27.0	130 10.7	-15 35.3	20 05.6	117 -3 46.2	+139
	13	14 15.5	51 13.0	40.1	330 09.4	24.5	262 36.8	27.0	145 13.3	35.3	34 36.3	117 3 32.3	+140
	14	29 17.9	66 12.5	39.3	345 10.2	25.0	277 39.2	27.0	160 15.8	35.3	49 07.0	117 3 18.3	+140
	15	44 20.4	81 12.1	38.5	0 10.9	25.5	292 41.6	27.0	175 18.4	35.2	63 37.7	117 3 04.3	+140
	16	59 22.9	96 11.6	37.7	15 11.7	26.0	307 44.0	27.0	190 20.9	35.2	78 08.4	117 2 50.3	+141
	17	74 25.3	111 11.1	37.0	30 12.4	26.5	322 46.4	27.0	205 23.5	35.2	92 39.1	116 2 36.2	+141
	18	89 27.8	126 10.6	-14 36.2	45 13.1	+17 27.0	337 48.8	+22 26.9	220 26.0	-15 35.2	107 09.7	116 -2 22.1	+141
	19	104 30.2	141 10.2	35.4	60 13.9	27.5	352 51.2	26.9	235 28.6	35.1	121 40.3	116 2 08.0	+142
	20	119 32.7	156 09.7	34.6	75 14.6	28.1	7 53.7	26.9	250 31.1	35.1	136 10.9	116 1 53.8	+142
	21	134 35.2	171 09.2	33.8	90 15.4	28.6	22 56.1	26.9	265 33.7	35.1	150 41.5	115 1 39.6	+142
	22	149 37.6	186 08.8	33.0	105 16.1	29.1	37 58.5	26.9	280 36.2	35.0	165 12.0	115 1 25.4	+142
	23	164 40.1	201 08.3	32.2	120 16.9	29.6	53 00.9	26.9	295 38.8	35.0	179 42.5	115 1 11.2	+143
	24	179 42.6	216 07.8	-14 31.4	135 17.6	+17 30.1	68 03.3	+22 26.9	310 41.3	-15 35.0	194 13.0	114 -0 56.9	+142
code	-	- 5	+ 8	+ 7	+ 5	+ 24	0	+ 25	0				

G M T	SUN			STARS			Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS						
	GHA	Dec.	No.	Name	SHA	Dec.				20	21	22	23	Alt.	Sun's					
															Low'r Limb	Venus	Mars			
h	°	'	°				N	h	m	h	m	h	m	h	m	°	'	'	'	
20	0	178 01.8	- 0 33.2	7	Acamar	315 51.7	-40 29.1	72	5 57	0 27	6 38	6 01	5 35	5 12						
	1	193 02.0	32.2	5	Achernar	335 59.6	-57 27.9	70	5 58	1 55	6 06	5 45	5 27	5 12						
	2	208 02.0	31.2	30	Acrux	173 57.6	-62 51.2	68	5 59	2 30	5 43	5 31	5 21	5 12						
	3	223 02.4	.. 30.2	19	Adhara	255 46.7	-28 54.9	66	5 59	2 54	5 25	5 20	5 16	5 12						
	4	238 02.6	.. 29.2	10	Aldebaran	291 39.6	+16 25.3	64	6 00	3 12	5 09	5 11	5 12	5 12						
	5	253 02.7	28.2					62	6 01	3 26	4 57	5 03	5 08	5 12						
	6	268 02.9	- 0 27.3	32	Alioth	166 58.2	+56 11.9	60	6 01	3 38	4 46	4 56	5 05	5 13						
	7	283 03.1	.. 26.3	44	Alkaid	153 32.7	+49 31.9	58	6 01	3 48	4 37	4 50	5 02	5 13						
	8	298 03.3	.. 25.3	55	Al Na'ir	28 38.8	-47 10.6	56	6 02	3 56	4 29	4 45	4 59	5 13						
	9	313 03.5	.. 24.3	15	Alnilam	276 30.7	- 1 13.9	54	6 02	4 03	4 21	4 40	4 57	5 13						
	10	328 03.7	.. 23.3	25	Alphard	218 38.7	- 8 28.1	52	6 02	4 09	4 15	4 36	4 55	5 13						
	11	343 03.8	.. 22.3					50	6 02	4 15	4 09	4 32	4 53	5 13						
	12	358 04.0	- 0 21.3	41	Alphecca	126 47.7	+26 51.6	45	6 03	4 26	3 56	4 23	4 48	5 13						
	13	13 04.2	.. 20.3	1	Alpheratz	358 29.1	+28 50.6	40	6 03	4 34	3 45	4 16	4 45	5 13						
	14	28 04.4	.. 19.4	51	Altair	62 50.9	+ 8 44.8	35	6 03	4 40	3 36	4 09	4 42	5 13						
	15	43 04.6	.. 18.4	2	Ankaa	353 59.0	-42 32.9	30	6 04	4 45	3 27	4 04	4 39	5 14						
	16	58 04.8	.. 17.4	42	Antares	113 19.7	-26 20.1	20	6 04	4 52	3 13	3 54	4 34	5 14						
	17	73 05.0	.. 16.4					10	6 04	4 55	3 01	3 45	4 30	5 14						
	18	88 05.1	- 0 15.4	37	Arcturus	146 35.2	+19 24.6	0	6 04	4 55	2 49	3 37	4 26	5 14						
	19	103 05.3	.. 14.4	43	Atria	109 00.6	-68 56.7	10	6 04	4 54	2 38	3 29	4 22	5 14						
	20	118 05.5	.. 13.4	22	Avior	234 35.6	-59 22.2	20	6 04	4 51	2 25	3 21	4 17	5 15						
	21	133 05.7	.. 12.4	13	Bellatrix	279 18.9	+ 6 18.6	30	6 04	4 43	2 11	3 11	4 12	5 15						
	22	148 05.9	.. 11.4	16	Betelge'se	271 48.5	+ 7 23.9	35	6 03	4 38	2 03	3 05	4 09	5 15						
	23	163 06.1	.. 10.5					40	6 03	4 31	1 53	2 59	4 06	5 15						
				17	Canopus	264 15.5	-52 40.6	45	6 03	4 22	1 42	2 51	4 03	5 16						
				12	Capella	281 39.1	+45 57.4	50	6 02	4 11	1 28	2 42	3 58	5 16						
				53	Deneb	50 01.6	+45 07.0	52	6 02	4 05	1 22	2 38	3 56	5 16						
				28	Denebola	183 17.8	+14 49.1	54	6 02	3 59	1 15	2 33	3 54	5 16						
				4	Diphda	349 39.9	-18 14.0	56	6 02	3 51	1 07	2 28	3 51	5 16						
				27	Dubhe	194 44.3	+61 59.5	60	6 01	3 43	0 58	2 22	3 48	5 17						
				14	Elnath	279 07.9	+28 34.4	S												
				47	Eltanin	91 06.4	+51 29.3		Lat.	Sunset	Twlt. ends	Moonset								
				54	Enif	34 30.2	+ 9 40.1		N.			20	21	22	23					
				56	Fomalhaut	16 12.3	-29 51.6		h	m	h	m	h	m	h	m				
				31	Gacrux	172 49.1	-56 51.9	72	18 20	///	11 44	14 03	16 11	18 20						
				29	Gienah	176 36.9	-17 17.8	70	18 19	22 33	12 14	14 17	16 16	18 15						
				35	Hadar	149 49.5	-60 09.5	68	18 18	21 54	12 37	14 28	16 19	18 12						
				6	Hamal	328 50.4	+23 15.1	66	18 17	21 28	12 54	14 38	16 22	18 08						
				48	Kaus Aust.	84 41.7	-34 24.4	64	18 16	21 09	13 08	14 45	16 24	18 06						
				40	Kochab	137 16.9	+74 20.0	60	18 15	20 42	13 29	14 58	16 28	18 01						
				57	Makab	14 22.1	+14 57.8	58	18 15	20 32	13 38	15 03	16 30	17 59						
				8	Menkar	315 00.9	+ 3 54.9	56	18 14	20 23	13 45	15 07	16 31	17 58						
				36	Menkent	148 58.8	-36 09.2	54	18 14	20 16	13 52	15 11	16 33	17 56						
				24	Miapl'dus	221 48.5	-69 32.3	52	18 14	20 09	13 58	15 15	16 34	17 55						
				9	Mirfak	309 43.2	+49 42.4	45	18 13	20 03	14 03	15 18	16 35	17 54						
				50	Nunki	76 52.4	-26 21.2	40	18 12	19 43	14 24	15 31	16 39	17 49						
				52	Peacock	54 28.2	-56 52.6	35	18 12	19 37	14 33	15 36	16 40	17 47						
				21	Pollux	244 20.9	+28 08.1	30	18 12	19 32	14 40	15 40	16 42	17 45						
				20	Procyon	245 45.2	+ 5 20.3	20	18 11	19 24	14 52	15 48	16 44	17 43						
								10	18 11	19 21	15 03	15 54	16 46	17 40						
				46	R'alhague	96 46.9	+12 35.2	0	18 11	19 20	15 12	16 00	16 48	17 38						
				26	Regulus	208 29.6	+12 11.0	10	18 11	19 21	15 22	16 06	16 50	17 35						
				11	Rigel	281 54.1	- 8 15.3	20	18 11	19 24	15 33	16 13	16 52	17 33						
				38	Rigel Kent.	140 51.0	-60 39.2	30	18 11	19 31	15 45	16 20	16 55	17 30						
				44	Sabik	103 02.5	-15 40.4	35	18 11	19 36	15 51	16 24	16 56	17 28						
								40	18 11	19 42	15 59	16 29	16 57	17 26						
				3	Schedar	350 31.0	+56 17.6	45	18 11	19 50	16 08	16 34	16 59	17 24						
				45	Shaula	97 21.1	-37 04.3	50	18 12	20 02	16 19	16 41	17 01	17 21						
				18	Sirius	259 12.1	-16 39.4	52	18 12	20 07	16 24	16 43	17 02	17 20						
				33	Spica	159 17.0	-10 55.9	54	18 12	20 13	16 29	16 47	17 03	17 19						
				23	Suhail	223 24.3	-43 15.4	56	18 12	20 20	16 35	16 50	17 04	17 17						
								58	18 12	20 28	16 42	16 54	17 05	17 16						
				49	Vega	81 08.6	+38 44.2	60	18 13	20 38	16 49	16 58	17 06	17 14						
				39	Zub'g'bi	137 53.5	-15 51.6	S												
				G M T	Equation of Time (App. - Mean)			GMT of Transit Meridian of Greenwich												
					20	21	22	DAY				Moon	Venus	Mars	Jupiter	Saturn	Subtract from table, back cover			
				h	m	s	m	s	m	s	h	m	h	m	h	m	h	m		
				0	- 7 53.1	- 7 35.4	- 7 17.5				20	9 01	9 34	15 02	19 36	3 29				
				6	- 7 48.7	- 7 30.9	- 7 13.1				21	9 49	9 34	15 01	19 32	3 25				
				12	- 7 44.3	- 7 26.5	- 7 08.6				22	10 37	9 35	14 59	19 29	3 21				
				18	- 7 39.8	- 7 22.0	- 7 04.1				23	11 26	9 36	14 58	19 25	3 17				
				24	- 7 35.4	- 7 17.5	- 6 59.6													
				24	178 15.2	+ 0 37.9														
code				-	+ 10															

G M T	♄		VENUS - 3.6		MARS 1.6		JUPITER -1.9		SATURN 0.5		MOON			
	GHA		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
23	h	°	°	°	°	°	°	°	°	°	°	°	°	°
	°	'	'	"	"	"	"	"	"	"	"	"	"	"
	0	179 42.6	216 07.8	-14 31.4	135 17.6	+17 30.1	68 03.3	+22 26.9	310 41.3	-15 35.0	194 13.0	114 -	0 56.9	+142
	1	194 45.0	231 07.4	30.6	150 18.3	30.6	83 05.7	26.9	325 43.9	34.9	208 43.4	114	0 42.7	+143
	2	209 47.5	246 06.9	29.8	165 19.1	31.1	98 08.1	26.9	340 46.4	34.9	223 13.8	114	0 28.4	+143
	3	224 50.0	261 06.4	.. 29.0	180 19.8	.. 31.6	113 10.5	.. 26.9	355 49.0	.. 34.9	237 44.2	113 -	0 14.1	+143
	4	239 52.4	276 06.0	28.2	195 20.6	32.2	128 12.9	26.9	10 51.5	34.9	252 14.5	114 +	0 00.2	+143
	5	254 54.9	291 05.5	27.4	210 21.3	32.7	143 15.4	26.9	25 54.1	34.8	266 44.9	112	0 14.5	+144
	6	269 57.4	306 05.0	-14 26.6	225 22.1	+17 33.2	158 17.8	+22 26.9	40 56.6	-15 34.8	281 15.1	113 +	0 28.9	+143
	7	284 59.8	321 04.6	25.8	240 22.8	33.7	173 20.2	26.9	55 59.2	34.8	295 45.4	112	0 43.2	+144
	8	300 02.3	336 04.1	25.0	255 23.5	34.2	188 22.6	26.9	71 01.7	34.7	310 15.6	112	0 57.6	+144
	9	315 04.7	351 03.6	.. 24.2	270 24.3	.. 34.7	203 25.0	.. 26.9	86 04.3	.. 34.7	324 45.8	111 -	1 12.0	+144
	10	330 07.2	6 03.2	23.4	285 25.0	35.2	218 27.4	26.8	101 06.8	34.7	339 15.9	111	1 26.4	+144
	11	345 09.7	21 02.7	22.6	300 25.8	35.7	233 29.8	26.8	116 09.4	34.6	353 46.0	111	1 40.8	+143
	12	0 12.1	36 02.2	-14 21.8	315 26.5	+17 36.2	248 32.2	+22 26.8	131 12.0	-15 34.6	8 16.1	110 +	1 55.1	+144
	13	15 14.6	51 01.8	21.0	330 27.3	36.7	263 34.6	26.8	146 14.5	34.6	22 46.1	110	2 09.5	+144
	14	30 17.1	66 01.3	20.2	345 28.0	37.2	278 37.0	26.8	161 17.1	34.6	37 16.1	109	2 23.9	+144
	15	45 19.5	81 00.8	.. 19.4	0 28.7	.. 37.7	293 39.4	.. 26.8	176 19.6	.. 34.5	51 46.0	109 -	2 38.3	+144
	16	60 22.0	96 00.4	18.6	15 29.5	38.3	308 41.8	26.8	191 22.2	34.5	66 15.9	108	2 52.7	+144
	17	75 24.5	110 59.9	17.8	30 30.2	38.8	323 44.2	26.8	206 24.7	34.5	80 45.7	109	3 07.1	+144
	18	90 26.9	125 59.4	-14 17.0	45 31.0	+17 39.3	338 46.6	+22 26.8	221 27.3	-15 34.4	95 15.6	107 +	3 21.5	+144
	19	105 29.4	140 59.0	16.2	60 31.7	39.8	353 49.0	26.8	236 29.8	34.4	109 45.3	107	3 35.9	+144
	20	120 31.8	155 58.5	15.4	75 32.4	40.3	8 51.5	26.8	251 32.4	34.4	124 15.0	107	3 50.3	+143
	21	135 34.3	170 58.0	.. 14.5	90 33.2	.. 40.8	23 53.9	.. 26.8	266 34.9	.. 34.3	138 44.7	106 -	4 04.6	+144
22	150 36.8	185 57.6	13.7	105 33.9	41.3	38 56.3	26.8	281 37.5	34.3	153 14.3	106	4 19.0	+143	
23	165 39.2	200 57.1	12.9	120 34.7	41.8	53 58.7	26.8	296 40.0	34.3	167 43.9	105	4 33.3	+143	
24	0	180 41.7	215 56.7	-14 12.1	135 35.4	+17 42.3	69 01.1	+22 26.7	311 42.6	-15 34.2	182 13.4	105 +	4 47.6	+144
	1	195 44.2	230 56.2	11.3	150 36.1	42.8	84 03.5	26.7	326 45.2	34.2	196 42.9	104	5 02.0	+142
	2	210 46.6	245 55.7	10.5	165 36.9	43.3	99 05.9	26.7	341 47.7	34.2	211 12.3	104	5 16.2	+143
	3	225 49.1	260 55.3	.. 09.7	180 37.6	.. 43.8	114 08.3	.. 26.7	356 50.3	.. 34.2	225 41.7	103 -	5 30.5	+143
	4	240 51.6	275 54.8	08.9	195 38.4	44.3	129 10.7	26.7	11 52.8	34.1	240 11.0	103	5 44.8	+142
	5	255 54.0	290 54.4	08.0	210 39.1	44.8	144 13.1	26.7	26 55.4	34.1	254 40.3	102	5 59.0	+142
	6	270 56.5	305 53.9	-14 07.2	225 39.8	+17 45.3	159 15.5	+22 26.7	41 57.9	-15 34.1	269 09.5	102 +	6 13.2	+142
	7	285 59.0	320 53.4	06.4	240 40.6	45.8	174 17.9	26.7	57 00.5	34.0	283 38.7	101	6 27.4	+142
	8	301 01.4	335 53.0	05.6	255 41.3	46.3	189 20.3	26.7	72 03.0	34.0	298 07.8	100	6 41.6	+141
	9	316 03.9	350 52.5	.. 04.8	270 42.1	.. 46.8	204 22.7	.. 26.7	87 05.6	.. 34.0	312 36.8	100	6 55.7	+141
	10	331 06.3	5 52.1	03.9	285 42.8	47.3	219 25.1	26.7	102 08.2	33.9	327 05.8	99	7 09.8	+141
	11	346 08.8	20 51.6	03.1	300 43.5	47.8	234 27.5	26.7	117 10.7	33.9	341 34.7	99	7 23.9	+140
	12	1 11.3	35 51.1	-14 02.3	315 44.3	+17 48.4	249 29.9	+22 26.6	132 13.3	-15 33.9	356 03.6	98 +	7 37.9	+140
	13	16 13.7	50 50.7	01.5	330 45.0	48.9	264 32.3	26.6	147 15.8	33.8	10 32.4	98	7 51.9	+140
	14	31 16.2	65 50.2	14 00.7	345 45.8	49.4	279 34.7	26.6	162 18.4	33.8	25 01.2	97	8 05.9	+139
	15	46 18.7	80 49.8	-13 59.8	0 46.5	.. 49.9	294 37.1	.. 26.6	177 20.9	.. 33.8	39 29.9	96 -	8 19.8	+139
	16	61 21.1	95 49.3	59.0	15 47.2	50.4	309 39.5	26.6	192 23.5	33.7	53 58.5	96	8 33.7	+139
	17	76 23.6	110 48.8	58.2	30 48.0	50.9	324 41.9	26.6	207 26.1	33.7	68 27.1	95	8 47.6	+138
	18	91 26.1	125 48.4	-13 57.4	45 48.7	+17 51.4	339 44.3	+22 26.6	222 28.6	-15 33.7	82 55.6	95 +	9 01.4	+137
	19	106 28.5	140 47.9	56.5	60 49.4	51.9	354 46.6	26.6	237 31.2	33.6	97 24.1	94	9 15.1	+138
	20	121 31.0	155 47.5	55.7	75 50.2	52.4	9 49.0	26.6	252 33.7	33.6	111 52.5	93	9 28.9	+136
	21	136 33.5	170 47.0	.. 54.9	90 50.9	.. 52.9	24 51.4	.. 26.6	267 36.3	.. 33.6	126 20.8	92 -	9 42.5	+137
	22	151 35.9	185 46.6	54.1	105 51.7	53.4	39 53.8	26.6	282 38.8	33.6	140 49.0	92	9 56.2	+135
	23	166 38.4	200 46.1	53.2	120 52.4	53.9	54 56.2	26.6	297 41.4	33.5	155 17.2	92	10 09.7	+135
25	0	181 40.8	215 45.7	-13 52.4	135 53.1	+17 54.4	69 58.6	+22 26.5	312 44.0	-15 33.5	169 45.4	90 +	10 23.2	+135
	1	196 43.3	230 45.2	51.6	150 53.9	54.9	85 01.0	26.5	327 46.5	33.5	184 13.4	90	10 36.7	+134
	2	211 45.8	245 44.7	50.7	165 54.6	55.4	100 03.4	26.5	342 49.1	33.4	198 41.4	89	10 50.1	+133
	3	226 48.2	260 44.3	.. 49.9	180 55.4	.. 55.8	115 05.8	.. 26.5	357 51.6	.. 33.4	213 09.3	89	.. 11 03.4	+133
	4	241 50.7	275 43.8	49.1	195 56.1	56.3	130 08.2	26.5	12 54.2	33.4	227 37.2	88	11 16.7	+133
	5	256 53.2	290 43.4	48.3	210 56.8	56.8	145 10.6	26.5	27 56.8	33.3	242 05.0	87	11 30.0	+131
	6	271 55.6	305 42.9	-13 47.4	225 57.6	+17 57.3	160 13.0	+22 26.5	42 59.3	-15 33.3	256 32.7	87	+11 43.1	+131
	7	286 58.1	320 42.5	46.6	240 58.3	57.8	175 15.4	26.5	58 01.9	33.3	271 00.4	86	11 56.2	+130
	8	302 00.6	335 42.0	45.8	255 59.0	58.3	190 17.8	26.5	73 04.4	33.2	285 28.0	85	12 09.2	+130
	9	317 03.0	350 41.6	.. 44.9	270 59.8	.. 58.8	205 20.2	.. 26.5	88 07.0	.. 33.2	299 55.5	84	.. 12 22.2	+129
	10	332 05.5	5 41.1	44.1	286 00.5	59.3	220 22.5	26.5	103 09.6	33.2	314 22.9	84	12 35.1	+128
	11	347 07.9	20 40.7	43.2	301 01.2	17 59.8	235 24.9	26.4	118 12.1	33.1	328 50.3	83	12 47.9	+127
	12	2 10.4	35 40.2	-13 42.4	316 02.0	+18 00.3	250 27.3	+22 26.4	133 14.7	-15 33.1	343 17.6	82	+13 00.6	+127
	13	17 12.9	50 39.8	41.6	331 02.7	00.8	265 29.7	26.4	148 17.2	33.1	357 44.8	82	13 13.3	+126
	14	32 15.3	65 39.3	40.7	346 03.5	01.3	280 32.1	26.4	163 19.8	33.0	12 12.0	81	13 25.9	+125
	15	47 17.8	80 38.9	.. 39.9	1 04.2	.. 01.8	295 34.5	.. 26.4	178 22.4	.. 33.0	26 39.1	80	.. 13 38.4	+124
	16	62 20.3	95 38.4	39.0	16 04.9	02.3	310 36.9	26.4	193 24.9	33.0	41 06.1	79	13 50.8	+124
	17	77 22.7	110 38.0	38.2	31 05.7	02.8	325 39.3	26.4	208 27.5	32.9	55 33.0	79	14 03.2	

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.	No.	Name	SHA	Dec.				23	24	25	26	Alt.	Sun's Low'r Limb	Venus	Mars		
h	°	'			°	'	N	h	m	h	m	h	m	h	m	°	'	'	'
23 0	178 15.2	+ 0 37.9	7	Acamar	315 51.7	-40 29.1	72	5 42	111	5 12	4 48	4 20	3 34			Alt.	Sun's Low'r Limb	Venus	Mars
1	193 15.4	38.9	5	Achernar	335 59.6	-57 27.9	70	5 44	1 20	5 12	4 56	4 38	4 13			Add	Add	Add	Add
2	208 15.6	39.9	30	Acruz	173 57.6	-62 51.2	68	5 46	2 07	5 12	5 03	4 53	4 40						
3	223 15.8	40.9	19	Adhara	255 46.8	-28 54.9	66	5 48	2 36	5 12	5 08	5 05	5 01						
4	238 15.9	41.9	10	Aldebaran	291 39.6	+16 25.3	64	5 49	2 57	5 12	5 13	5 15	5 18						
5	253 16.1	42.9					62	5 51	3 13	5 12	5 17	5 23	5 32	0	0.4	0.1	0.1		
6	268 16.3	+ 0 43.9	32	Alioth	166 58.2	+56 11.9	60	5 52	3 27	5 13	5 21	5 31	5 44	30	0.4	0.1	0.1		
7	283 16.5	44.9	34	Alkaid	153 32.7	+49 31.9	58	5 53	3 38	5 13	5 24	5 37	5 55	45	0.4	0.1	0.0		
8	298 16.7	45.8	55	Al Na'ir	28 38.7	-47 10.6	56	5 54	3 46	5 13	5 27	5 43	6 04	60	0.4	0.1	0.0		
9	313 16.9	46.8	15	Alnilam	276 30.7	-1 13.9	54	5 55	3 55	5 13	5 30	5 49	6 12	75	0.4	0.0	0.0		
10	328 17.1	47.8	25	Alphard	218 38.7	-8 28.1	52	5 55	4 02	5 13	5 32	5 53	6 19	90					
11	343 17.3	48.8					50	5 56	4 07	5 13	5 34	5 58	6 25						
12	358 17.4	+ 0 49.8	41	Alphecca	126 47.7	+26 51.6	45	5 57	4 19	5 13	5 39	6 07	6 40	Moon's Lower Limb					
13	13 17.6	50.8	1	Alpheratz	358 29.1	+28 50.6	40	5 58	4 29	5 13	5 43	6 15	6 51	Add					
14	28 17.8	51.8	51	Altair	62 50.9	+8 44.8	35	5 59	4 36	5 13	5 46	6 22	7 01	Alt.	23	24	25		
15	43 18.0	52.7	2	Ankaa	353 59.0	-42 32.9	30	6 00	4 41	5 14	5 49	6 28	7 10	°	'	'	'		
16	58 18.2	53.7	42	Antares	113 19.7	-26 20.1	20	6 01	4 49	5 14	5 55	6 38	7 26	0	18.2	19.0	19.5		
17	73 18.4	54.7					10	6 02	4 53	5 14	6 00	6 48	7 39	4	18.2	19.0	19.5		
18	88 18.6	+ 0 55.7	37	Arcturus	146 35.2	+19 24.6	0	6 03	4 55	5 14	6 04	6 57	7 52	8	18.2	18.9	19.5		
19	103 18.8	56.7	43	Atria	109 00.6	-68 56.7	10	6 04	4 54	5 14	6 09	7 05	8 05	12	18.2	18.9	19.5		
20	118 19.0	57.7	22	Avior	234 35.6	-59 22.2	20	6 05	4 52	5 15	6 14	7 15	8 19	16	18.2	18.9	19.4		
21	133 19.1	58.7	13	Bellatrix	279 18.9	+6 18.6	30	6 06	4 45	5 15	6 19	7 26	8 34	20	18.1	18.9	19.3		
22	148 19.3	0 59.6	16	Betelge'se	271 48.6	+7 23.9	35	6 06	4 41	5 15	6 23	7 32	8 44	24	18.1	18.8	19.3		
23	163 19.5	1 00.6					40	6 06	4 35	5 15	6 26	7 40	8 54	28	18.0	18.7	19.2		
24 0	178 19.7	+ 1 01.6	17	Canopus	264 15.5	-52 40.6	45	6 07	4 27	5 16	6 31	7 48	9 07	32	17.9	18.6	19.1		
1	193 19.9	02.6	12	Capella	281 39.1	+45 57.4	50	6 07	4 16	5 16	6 36	7 59	9 22	36	17.8	18.4	18.8		
2	208 20.1	03.6	53	Deneb	50 01.5	+45 07.0	52	6 07	4 12	5 16	6 39	8 04	9 30	40	17.7	18.3	18.7		
3	223 20.3	04.6	28	Denebola	183 17.8	+14 49.1	54	6 08	4 06	5 16	6 41	8 09	9 38	44	17.6	18.2	18.5		
4	238 20.5	05.6	4	Diphda	349 39.9	-18 13.9	56	6 08	3 59	5 16	6 44	8 15	9 47	48	17.5	18.0	18.4		
5	253 20.6	06.5					58	6 08	3 51	5 17	6 48	8 22	9 57	52	17.4	17.9	18.2		
6	268 20.8	+ 1 07.5	27	Dubhe	194 44.3	+61 59.5	60	6 08	3 42	5 17	6 51	8 29	10 09	56	17.2	17.7	18.0		
7	283 21.0	08.5	14	Elnath	279 07.9	+28 34.3	S							60	17.1	17.6	17.9		
8	298 21.2	09.5	47	Eltanin	91 06.4	+51 29.3								64	17.0	17.4	17.7		
9	313 21.4	10.5	54	Enif	34 30.2	+9 40.1								68	16.8	17.2	17.5		
10	328 21.6	11.5	56	Fomalhaut	16 12.3	-29 51.6								72	16.7	17.0	17.2		
11	343 21.8	12.5					N	h	m	h	m	h	m	h	m				
12	358 22.0	+ 1 13.4	31	Gacrux	172 49.1	-56 51.9	72	18 34	111	18 20	20 37	23 18	25 53	76	16.6	16.8	17.0		
13	13 22.2	14.4	29	Gienah	176 36.9	-17 17.8	70	18 31	23 12	18 15	20 21	22 40	25 53	80	16.4	16.7	16.8		
14	28 22.3	15.4	35	Hadar	149 49.4	-60 09.5	68	18 29	22 17	18 12	20 09	22 15	24 35	84	16.3	16.5	16.6		
15	43 22.5	16.4	6	Hamal	328 50.4	+23 15.1	66	18 27	21 45	18 08	19 59	21 55	23 58	88	16.3	16.5	16.6		
16	58 22.7	17.4	48	Kaus Aust.	84 41.7	-34 24.4	64	18 25	21 23	18 06	19 50	21 39	23 32	90	16.2	16.3	16.4		
17	73 22.9	18.4					62	18 24	21 06	18 03	19 43	21 26	23 12	Add to table, back cover					
18	88 23.1	+ 1 19.4	40	Kochab	137 16.9	+74 20.0	60	18 23	20 52	18 01	19 37	21 16	22 55	Moon's Upper Limb					
19	103 23.3	20.3	57	Markab	14 22.1	+14 57.8	58	18 21	20 40	17 59	19 31	21 06	22 41	Subtract					
20	118 23.5	21.3	8	Menkar	315 00.9	+3 54.9	56	18 21	20 31	17 58	19 27	20 58	22 29	Alt.	23	24	25		
21	133 23.7	22.3	36	Menkent	148 58.8	-36 09.2	54	18 20	20 23	17 56	19 22	20 51	22 19	°	'	'	'		
22	148 23.8	23.3	24	Miap'ldus	221 48.6	-69 32.3	52	18 19	20 16	17 55	19 19	20 44	22 09	0					
23	163 24.0	24.3					50	18 18	20 09	17 54	19 15	20 38	22 01	4	14.0	13.6	13.3		
24 0	178 24.2	+ 1 25.3	9	Mirfak	309 43.3	+49 42.4	45	18 17	19 57	17 51	19 07	20 25	21 44	8	14.0	13.6	13.3		
1	193 24.4	26.2	50	Nunki	76 52.4	-26 21.2	40	18 15	19 46	17 49	19 01	20 15	21 30	12	14.1	13.6	13.3		
2	208 24.6	27.2	52	Peacock	54 28.1	-56 52.6	35	18 14	19 39	17 47	18 56	20 06	21 18	16	14.1	13.7	13.4		
3	223 24.8	28.2	21	Pollux	244 20.9	+28 08.1	30	18 13	19 33	17 45	18 51	19 58	21 07	20	14.1	13.7	13.4		
4	238 25.0	29.2	20	Procyon	245 45.3	+5 20.3	20	18 12	19 25	17 43	18 43	19 45	20 49	24	14.2	13.8	13.5		
5	253 25.2	30.2					10	18 11	19 21	17 40	18 35	19 33	20 34	28	14.2	13.9	13.6		
6	268 25.4	+ 1 31.2	46	R'alhague	96 46.9	+12 35.2	0	18 10	19 19	17 38	18 29	19 22	20 19	32	14.3	13.9	13.7		
7	283 25.5	32.2	26	Regulus	208 29.6	+12 11.0	10	18 09	19 19	17 35	18 22	19 12	20 05	36	14.4	14.0	13.8		
8	298 25.7	33.1	11	Rigel	281 54.1	-8 15.3	20	18 08	19 21	17 33	18 15	19 00	19 49	40	14.5	14.2	14.0		
9	313 25.9	34.1	38	Rigel Kent.	140 51.0	-60 39.2	30	18 07	19 27	17 30	18 07	18 47	19 32	44	14.6	14.3	14.1		
10	328 26.1	35.1	44	Sabik	103 02.5	-15 40.4	35	18 07	19 31	17 28	18 02	18 39	19 21	48	14.7	14.4	14.2		
11	343 26.3	36.1					40	18 06	19 36	17 26	17 57	18 31	19 10	52	14.8	14.5	14.4		
12	358 26.5	+ 1 37.1	3	Schedar	350 31.0	+56 17.6	45	18 06	19 44	17 24	17 51	18 21	18 56	56	14.9	14.7	14.6		
13	13 26.7	38.1	45	Shaula	97 21.1	-37 04.3	50	18 05	19 54	17 21	17 43	18 09	18 39	60	15.0	14.9	14.8		
14	28 26.9	39.0	18	Sirius	259 12.1	-16 39.4	52	18 05	19 59	17 20	17 40	18 03	18						

G M T	VENUS — 3.6		MARS 1.6		JUPITER — 1.9		SATURN 0.5		MOON				
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code	
h	o	°	o	°	o	°	o	°	o	°	o	°	
26	0	182 40.0	215 34.8	-13 32.3	136 10.8	+18 06.2	70 56.0	+22 26.3	313 45.4	-15 32.7	156 39.6	74 +15 27.2	+116
	1	197 42.4	230 34.4	31.5	151 11.5	06.7	85 58.4	26.3	328 48.0	32.7	171 06.0	72 15 38.8	+115
	2	212 44.9	245 33.9	30.6	166 12.3	07.2	101 00.7	26.3	343 50.5	32.6	185 32.2	73 15 50.3	+115
	3	227 47.4	260 33.5	29.8	181 13.0	07.7	116 03.1	26.3	358 53.1	32.6	199 58.5	71 -16 01.8	+113
	4	242 49.8	275 33.0	28.9	196 13.8	08.2	131 05.5	26.3	13 55.7	32.6	214 24.6	71 16 13.1	+112
	5	257 52.3	290 32.6	28.1	211 14.5	08.7	146 07.9	26.3	28 58.2	32.6	228 50.7	70 16 24.3	+112
	6	272 54.8	305 32.1	-13 27.2	226 15.2	+18 09.2	161 10.3	+22 26.3	44 00.8	-15 32.5	243 16.7	69 +16 35.5	+110
	7	287 57.2	320 31.7	26.4	241 16.0	09.7	176 12.7	26.3	59 03.4	32.5	257 42.6	68 16 46.5	+109
	8	302 59.7	335 31.2	25.5	256 16.7	10.2	191 15.0	26.2	74 05.9	32.5	272 08.4	68 16 57.4	+108
	9	318 02.2	350 30.8	24.7	271 17.4	10.7	206 17.4	26.2	89 08.5	32.4	286 34.2	67 -17 08.2	+107
	10	333 04.6	5 30.3	23.8	286 18.2	11.2	221 19.8	26.2	104 11.1	32.4	300 59.9	67 17 18.9	+106
	11	348 07.1	20 29.9	23.0	301 18.9	11.6	236 22.2	26.2	119 13.6	32.4	315 25.6	65 17 29.5	+104
	12	3 09.5	35 29.4	-13 22.1	316 19.6	+18 12.1	251 24.6	+22 26.2	134 16.2	-15 32.3	329 51.1	65 +17 39.9	+104
	13	18 12.0	50 29.0	21.3	331 20.4	12.6	266 27.0	26.2	149 18.7	32.3	344 16.6	64 17 50.3	+102
	14	33 14.5	65 28.6	20.4	346 21.1	13.1	281 29.3	26.2	164 21.3	32.3	358 42.0	64 18 00.5	+101
	15	48 16.9	80 28.1	19.5	1 21.8	13.6	296 31.7	26.2	179 23.9	32.2	13 07.4	63 -18 10.6	+100
	16	63 19.4	95 27.7	18.7	16 22.6	14.1	311 34.1	26.2	194 26.4	32.2	27 32.7	62 18 20.6	+ 99
	17	78 21.9	110 27.2	17.8	31 23.3	14.6	326 36.5	26.1	209 29.0	32.2	41 57.9	62 18 30.5	+ 97
	18	93 24.3	125 26.8	-13 17.0	46 24.0	+18 15.1	341 38.9	+22 26.1	224 31.6	-15 32.1	56 23.1	60 +18 40.2	+ 97
	19	108 26.8	140 26.3	16.1	61 24.8	15.5	356 41.2	26.1	239 34.1	32.1	70 48.1	60 18 49.9	+ 95
	20	123 29.3	155 25.9	15.3	76 25.5	16.0	1 43.6	26.1	254 36.7	32.1	85 13.1	60 18 59.4	+ 93
	21	138 31.7	170 25.5	14.4	91 26.2	16.5	26 46.0	26.1	269 39.3	32.0	99 38.1	59 -19 08.7	+ 93
	22	153 34.2	185 25.0	13.5	106 27.0	17.0	41 48.4	26.1	284 41.8	32.0	114 03.0	58 19 18.0	+ 91
	23	168 36.7	200 24.6	12.7	121 27.7	17.5	56 50.8	26.1	299 44.4	32.0	128 27.8	58 19 27.1	+ 90
27	0	183 39.1	215 24.1	-13 11.8	136 28.4	+18 18.0	71 53.1	+22 26.1	314 47.0	-15 31.9	142 52.6	56 +19 36.1	+ 88
	1	198 41.6	230 23.7	11.0	151 29.2	18.5	86 55.5	26.1	329 49.5	31.9	157 17.2	57 19 44.9	+ 87
	2	213 44.0	245 23.2	10.1	166 29.9	18.9	101 57.9	26.0	344 52.1	31.9	171 41.9	55 19 53.6	+ 86
	3	228 46.5	260 22.8	09.2	181 30.6	19.4	117 00.3	26.0	359 54.7	31.8	186 06.4	55 -20 02.2	+ 85
	4	243 49.0	275 22.4	08.4	196 31.4	19.9	132 02.6	26.0	14 57.2	31.8	200 30.9	55 20 10.7	+ 83
	5	258 51.4	290 21.9	07.5	211 32.1	20.4	147 05.0	26.0	29 59.8	31.8	214 55.4	54 20 19.0	+ 81
	6	273 53.9	305 21.5	-13 06.6	226 32.8	+18 20.9	162 07.4	+22 26.0	45 02.4	-15 31.7	229 19.8	53 +20 27.1	+ 81
	7	288 56.4	320 21.0	05.8	241 33.6	21.4	177 09.8	26.0	60 04.9	31.7	243 44.1	53 20 35.2	+ 78
	8	303 58.8	335 20.6	04.9	256 34.3	21.9	192 12.1	26.0	75 07.5	31.7	258 08.4	52 20 43.0	+ 78
	9	319 01.3	350 20.2	04.0	271 35.0	22.3	207 14.5	26.0	90 10.1	31.6	272 32.6	52 -20 50.8	+ 76
	10	334 03.8	5 19.7	03.2	286 35.8	22.8	222 16.9	26.0	105 12.6	31.6	286 56.8	51 20 58.4	+ 74
	11	349 06.2	20 19.3	02.3	301 36.5	23.3	237 19.3	25.9	120 15.2	31.5	301 20.9	50 21 05.8	+ 73
	12	4 08.7	35 18.9	-13 01.4	316 37.2	+18 23.8	252 21.6	+22 25.9	135 17.8	-15 31.5	315 44.9	51 +21 13.1	+ 72
	13	19 11.1	50 18.4	13 00.6	331 37.9	24.3	267 24.0	25.9	150 20.3	31.5	330 09.0	49 21 20.3	+ 70
	14	34 13.6	65 18.0	12 59.7	346 38.7	24.7	282 26.4	25.9	165 22.9	31.4	344 32.9	49 21 27.3	+ 69
	15	49 16.1	80 17.5	11 58.8	1 39.4	25.2	297 28.7	25.9	180 25.5	31.4	358 56.8	49 -21 34.2	+ 67
	16	64 18.5	95 17.1	10 58.0	16 40.1	25.7	312 31.1	25.9	195 28.0	31.4	13 20.7	48 21 40.9	+ 65
	17	79 21.0	110 16.7	9 57.1	31 40.9	26.2	327 33.5	25.9	210 30.6	31.3	27 44.5	48 21 47.4	+ 64
	18	94 23.5	125 16.2	-12 56.2	46 41.6	+18 26.7	342 35.9	+22 25.9	225 33.2	-15 31.3	42 08.3	47 +21 53.8	+ 63
	19	109 25.9	140 15.8	11 55.3	61 42.3	27.2	357 38.2	25.8	240 35.7	31.3	56 32.0	47 22 00.1	+ 61
	20	124 28.4	155 15.4	10 54.5	76 43.1	27.6	12 40.6	25.8	255 38.3	31.2	70 55.7	47 22 06.2	+ 59
	21	139 30.9	170 14.9	9 53.6	91 43.8	28.1	27 43.0	25.8	270 40.9	31.2	85 19.4	46 -22 12.1	+ 58
	22	154 33.3	185 14.5	8 52.7	106 44.5	28.6	42 45.3	25.8	285 43.5	31.2	99 43.0	45 -22 17.9	+ 56
	23	169 35.8	200 14.1	7 51.8	121 45.3	29.1	57 47.7	25.8	300 46.0	31.1	114 06.5	46 -22 23.5	+ 55
28	0	184 38.3	215 13.6	-12 51.0	136 46.0	+18 29.6	72 50.1	+22 25.8	315 48.6	-15 31.1	128 30.1	45 +22 29.0	+ 53
	1	199 40.7	230 13.2	50.1	151 46.7	30.0	87 52.4	25.8	330 51.2	31.1	142 53.6	45 22 34.3	+ 52
	2	214 43.2	245 12.8	49.2	166 47.4	30.5	102 54.8	25.8	345 53.7	31.0	157 17.1	44 22 39.5	+ 49
	3	229 45.6	260 12.3	48.3	181 48.2	31.0	117 57.2	25.7	0 56.3	31.0	171 40.5	44 -22 44.4	+ 49
	4	244 48.1	275 11.9	47.4	196 48.9	31.5	132 59.5	25.7	15 58.9	31.0	186 03.9	44 22 49.3	+ 46
	5	259 50.6	290 11.5	46.6	211 49.6	31.9	148 01.9	25.7	31 01.4	30.9	200 27.3	44 22 53.9	+ 46
	6	274 53.0	305 11.0	-12 45.7	226 50.4	+18 32.4	163 04.3	+22 25.7	46 04.0	-15 30.9	214 50.7	43 +22 58.5	+ 43
	7	289 55.5	320 10.6	44.8	241 51.1	32.9	178 06.6	25.7	61 06.6	30.9	229 14.0	43 23 02.8	+ 42
	8	304 58.0	335 10.2	43.9	256 51.8	33.4	193 09.0	25.7	76 09.2	30.8	243 37.3	43 23 07.0	+ 40
	9	320 00.4	350 09.7	43.0	271 52.6	33.8	208 11.4	25.7	91 11.7	30.8	258 00.6	43 23 11.0	+ 39
	10	335 02.9	5 09.3	42.2	286 53.3	34.3	223 13.7	25.7	106 14.3	30.8	272 23.9	43 23 14.9	+ 37
	11	350 05.4	20 08.9	41.3	301 54.0	34.8	238 16.1	25.6	121 16.9	30.7	286 47.2	42 23 18.6	+ 35
	12	5 07.8	35 08.4	-12 40.4	316 54.7	+18 35.3	253 18.5	+22 25.6	136 19.4	-15 30.7	301 10.4	43 +23 22.1	+ 33
	13	20 10.3	50 08.0	39.5	331 55.5	35.8	268 20.8	25.6	151 22.0	30.7	315 33.7	42 23 25.4	+ 32
	14	35 12.8	65 07.6	38.6	346 56.2	36.2	283 23.2	25.6	166 24.6	30.6	329 56.9	42 23 28.6	+ 31
	15	50 15.2	80 07.1	37.7	1 56.9	36.7	298 25.6	25.6	181 27.2	30.6	344 20.1	42 -23 31.7	+ 28
	16	65 17.7	95 06.7	36.8	16 57.7	37.2	313 27.9	25.6	196 29.7	30.5	358 43.3	42 23 34.5	+ 27
	17	80 20.1	110 06.3	36.0	31 58.4	37.6	328 30.3	25.6	211 32.3	30.5	13 06.5	42 23 37.2	+ 26

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.	No.	Name	SHA	Dec.								Alt.	Sun's Low'r Limb Add	Venus Add	Mars Add		
										26	27	28	29						
h	°	'	°	°	°	°	N	h	m	h	m	h	m	h	m				
26	0	178 28.8 + 1 48.9	7	Acamar	315 51.7 - 40 29.1	72	5 26	////	3 34	□	□	□	□	Alt.	Sun's Low'r Limb Add	Venus Add	Mars Add		
	1	193 29.0 49.9	5	Achernar	335 59.6 - 57 27.9	70	5 30	////	4 13	3 02	□	□	□	0	0	0.4	0.1		
	2	208 29.1 50.8	30	Acrux	173 57.6 - 62 51.3	68	5 34	1 39	4 40	4 20	□	□	□	30	0.4	0.1	0.1		
	3	223 29.3 .. 51.8	19	Adhara	255 46.8 - 28 54.9	66	5 36	2 16	5 01	4 59	4 57	5 09	45	0.4	0.1	0.1			
	4	238 29.5 52.8	10	Aldebaran	291 39.6 + 16 25.3	64	5 39	2 41	5 18	5 25	5 42	6 21	60	0.4	0.1	0.0			
	5	253 29.7 53.8				62	5 41	3 00	5 32	5 47	6 12	6 58	75	0.4	0.1	0.0			
	6	268 29.9 + 1 54.8	32	Alioth	166 58.2 + 56 11.9	60	5 43	3 15	5 44	6 04	6 35	7 24	90	0.4	0.0	0.0			
	7	283 30.1 55.7	34	Alkaid	153 32.7 + 49 31.9	58	5 44	3 26	5 55	6 18	6 53	7 44							
	8	298 30.3 56.7	55	Al Na'ir	28 38.7 - 47 10.6	56	5 46	3 36	6 04	6 31	7 09	8 01							
	9	313 30.5 .. 57.7	15	Alnilam	276 30.7 - 1 13.9	54	5 47	3 46	6 12	6 42	7 22	8 16							
	10	328 30.7 58.7	25	Alphard	218 38.7 - 8 28.1	52	5 48	3 54	6 19	6 51	7 34	8 28							
	11	343 30.9 1 59.7				50	5 49	4 00	6 25	7 00	7 44	8 39							
	12	358 31.0 + 2 00.7	41	Alphecca	126 47.7 + 26 51.6	45	5 52	4 13	6 40	7 18	8 06	9 02	Moon's Lower Limb						
	13	13 31.2 01.6	1	Alpheratz	358 29.1 + 28 50.6	40	5 53	4 23	6 51	7 34	8 23	9 21	Add						
	14	28 31.4 02.6	51	Altair	62 50.9 + 8 44.8	35	5 55	4 31	7 01	7 47	8 38	9 37	Alt.	26	27	28			
	15	43 31.6 .. 03.6	2	Ankaa	353 59.0 - 42 32.9	30	5 56	4 38	7 10	7 58	8 51	9 50	0	19.6	19.5	19.2			
	16	58 31.8 04.6	42	Antares	113 19.6 - 26 20.1	20	5 59	4 46	7 26	8 17	9 13	10 13	4	19.6	19.5	19.2			
	17	73 32.0 05.6				10	6 01	4 51	7 39	8 34	9 33	10 33	8	19.6	19.5	19.2			
	18	88 32.2 + 2 06.5	37	Arcturus	146 35.2 + 19 24.6	0	6 02	4 54	7 52	8 50	9 51	10 52	12	19.5	19.4	19.2			
	19	103 32.4 07.5	43	Atria	109 00.5 - 68 56.7	10	6 04	4 54	8 05	9 06	10 09	11 11	16	19.5	19.3	19.1			
	20	118 32.6 08.5	22	Avior	234 35.7 - 59 22.2	20	6 05	4 52	8 19	9 24	10 28	11 31	20	19.4	19.3	19.0			
	21	133 32.7 .. 09.5	13	Bellatrix	279 18.9 + 6 18.6	30	6 07	4 48	8 34	9 44	10 51	11 54	24	19.3	19.2	18.9			
	22	148 32.9 10.5	16	Betel'ge	271 48.6 + 7 23.9	35	6 08	4 43	8 44	9 55	11 04	12 08	28	19.1	19.0	18.7			
	23	163 33.1 11.5				40	6 09	4 38	8 54	10 09	11 19	12 23	32	18.9	18.8	18.6			
			17	Canopus	264 15.5 - 52 40.6	45	6 10	4 31	9 07	10 25	11 38	12 42	36	18.8	18.7	18.5			
			12	Capella	281 39.1 + 45 57.4	50	6 12	4 22	9 22	10 45	12 01	13 06	40	18.6	18.5	18.4			
			53	Deneb	50 01.5 + 45 07.0	52	6 12	4 18	9 30	10 54	12 12	13 17	44	18.5	18.4	18.2			
			28	Denebola	183 17.8 + 14 49.1	54	6 13	4 12	9 38	11 05	12 24	13 30	48	18.3	18.2	18.0			
			4	Diphda	349 39.9 - 18 13.9	56	6 14	4 06	9 47	11 17	12 38	13 45	52	18.1	18.0	17.9			
						58	6 14	3 59	9 57	11 31	12 55	14 02	56	17.9	17.9	17.7			
			27	Dubhe	194 44.3 + 61 59.5	60	6 15	3 51	10 09	11 47	13 15	14 23	60	17.7	17.7	17.5			
			14	El Nath	279 07.9 + 28 34.3	S							64	17.5	17.5	17.3			
			47	Eltanin	91 06.3 + 51 29.3								68	17.3	17.2	17.1			
			54	Enif	34 30.2 + 9 40.1								72	17.1	17.0	16.9			
			56	Fomalhaut	16 12.3 - 29 51.5	N							76	16.9	16.8	16.7			
													80	16.6	16.6	16.5			
			31	Gacrux	172 49.1 - 56 51.9	72	18 48	////	25 53	1 53	□	□	84	16.5	16.4	16.4			
			29	Gienah	176 36.9 - 17 17.9	70	18 43	////	25 53	1 53	□	□	88	Add to table, back cover					
			35	Hadar	149 49.4 - 60 09.5	68	18 40	22 46	24 35	0 35	□	□	90	Moon's Upper Limb					
			6	Hamal	328 50.4 + 23 15.1	66	18 37	22 04	23 58	26 05	2 05	4 02	Subtract						
			48	Kaus Aust.	84 41.6 - 34 24.4	64	18 34	21 37	23 32	25 21	1 21	2 50	Alt.	26	27	28			
						62	18 32	21 18	23 12	24 51	0 51	2 14	0	13.2	13.3	13.4			
			40	Kochab	137 16.9 + 74 20.0	60	18 30	21 02	22 55	24 29	0 29	1 48	4	13.2	13.3	13.5			
			57	Markab	14 22.1 + 14 57.8	58	18 28	20 49	22 41	24 11	0 11	1 27	8	13.3	13.3	13.5			
			8	Menkar	315 00.9 + 3 54.9	56	18 27	20 39	22 29	23 55	25 10	1 10	12	13.3	13.4	13.5			
			36	Menkent	148 58.8 - 36 09.2	54	18 25	20 29	22 19	23 42	24 56	0 56	16	13.4	13.4	13.6			
			24	Miapl'dus	221 48.6 - 69 32.3	52	18 24	20 22	22 09	23 31	24 43	0 43	20	13.5	13.5	13.7			
						50	18 23	20 15	22 01	23 21	24 32	0 32	24	13.5	13.6	13.7			
			9	Mirfak	309 43.3 + 49 42.4	45	18 20	20 00	21 44	23 00	24 09	0 09	28	13.6	13.7	13.8			
			50	Nunki	76 52.4 - 26 21.2	40	18 18	19 50	21 30	22 43	23 51	24 50	32	13.8	13.8	13.9			
			52	Peacock	54 28.1 - 56 52.6	35	18 17	19 42	21 18	22 28	23 35	24 35	36	13.9	14.0	14.1			
			21	Pollux	244 20.9 + 28 08.1	30	18 15	19 35	21 07	22 16	23 22	24 22	40	14.0	14.1	14.2			
			20	Procyon	245 45.3 + 5 20.3	20	18 13	19 27	20 49	21 54	22 59	23 59	44	14.2	14.2	14.3			
						10	18 11	19 21	20 34	21 36	22 39	23 39	48	14.4	14.4	14.5			
			46	R'alhague	96 46.9 + 12 35.3	0	18 09	19 18	20 19	21 19	22 20	23 21	52	14.5	14.6	14.6			
			26	Regulus	208 29.6 + 12 11.0	10	18 07	19 17	20 05	21 02	22 01	23 02	56	14.7	14.8	14.8			
			11	Rigel	281 54.1 - 8 15.3	20	18 05	19 18	19 49	20 43	21 41	22 43	60	14.9	14.9	15.0			
			38	Rigel Kent.	140 51.0 - 60 39.2	30	18 04	19 23	19 32	20 22	21 18	22 20	64	15.1	15.1	15.2			
			44	Sabik	103 02.5 - 15 40.4	35	18 03	19 27	19 21	20 10	21 05	22 06	68	15.3	15.3	15.3			
						40	18 01	19 31	19 10	19 55	20 49	21 50	72	15.5	15.5	15.5			
			3	Schedar	350 31.0 + 56 17.6	45	18 00	19 38	18 56	19 39	20 31	21 32	76	15.8	15.7	15.7			
			45	Shaula	97 21.1 - 37 04.3	50	17 59	19 47	18 39	19 18	20 07	21 09	80	16.0	16.0	15.9			
			18	Sirius	259 12.2 - 16 39.4	52	17 58	19 51	18 31	19 08	19 56	20 57	84	16.2	16.2	16.1			
			33	Spica	159 17.0 - 10 55.9	54	17 57	19 56	18 23	18 57	19 44	20 45	88	16.3	16.3	16.3			
			23	Suhail	223 24.3 - 43 15.4	56	17 57	20 03	18 13	18 45	19 29	20 30	90	Subtract from table, back cover					
						58	17 56	20 09	18 02	18 30	19 12	20 13							
			49	Vega	81 08.5 + 38 44.2	60	17 55	20 17	17 49	18 13	18 52	19 52							
			39	Zub'g'bi	137 53.5 - 15 51.6	S													
			G M T	Equation of Time (App.—Mean)			GMT of Transit Meridian of Greenwich												
				26	27	28	DAY	Moon	Venus	Mars	Jupiter	Saturn							
			h	m s	m s	m s	h m	h m	h m	h m	h m	h m							
			0	- 6 05.3	- 5 47.1	- 5 28.9	26	14 05	9 38	14 55	19 13	3 05							
			6	- 6 00.8	- 5 42.6	- 5 24.4	27	15 04	9 39	14 53	19 09	3 00							
			12	- 5 56.															

G M T	VENUS -3.5			MARS 1.7			JUPITER -1.8			SATURN 0.5			MOON			
	GHA	Dec.		GHA	Dec.		GHA	Dec.		GHA	Dec.		GHA	code	Dec.	code
29	h	°	'	°	'	°	°	'	°	°	'	°	°	'	°	'
0	185 37.4	215 03.3	-12 29.7	137 03.5	+18 41.0		73 46.8	+22 25.5		316 50.3	-15 30.3		113 48.9	42	+23 51.5	+ 13
1	200 39.9	230 02.9	28.8	152 04.2	41.4		88 49.2	25.5		331 52.9	30.2		128 12.1	43	23 52.8	+ 12
2	215 42.3	245 02.4	27.9	167 04.9	41.9		103 51.6	25.4		346 55.5	30.2		142 35.4	42	23 54.0	+ 11
3	230 44.8	260 02.0	.. 27.0	182 05.7	.. 42.4		118 53.9	.. 25.4		1 58.0	.. 30.2		156 58.6	43	23 55.1	+ 8
4	245 47.3	275 01.6	26.1	197 06.4	42.8		133 56.3	25.4		17 00.6	30.1		171 21.9	43	23 55.9	+ 7
5	260 49.7	290 01.1	25.3	212 07.1	43.3		148 58.6	25.4		32 03.2	30.1		185 45.2	43	23 56.6	+ 6
6	275 52.2	305 00.7	-12 24.4	227 07.8	+18 43.8		164 01.0	+22 25.4		47 05.7	-15 30.1		200 08.5	43	+23 57.2	+ 3
7	290 54.6	320 00.3	23.5	242 08.6	44.3		179 03.3	25.4		62 08.3	30.0		214 31.8	43	23 57.5	+ 2
8	305 57.1	334 59.9	22.6	257 09.3	44.7		194 05.7	25.4		77 10.9	30.0		228 55.1	44	23 57.7	+ 1
9	320 59.6	349 59.4	.. 21.7	272 10.0	.. 45.2		209 08.1	.. 25.4		92 13.5	.. 30.0		243 18.5	44	23 57.8	- 2
10	336 02.0	4 59.0	20.8	287 10.8	45.7		224 10.4	25.3		107 16.0	29.9		257 41.9	45	23 57.6	- 3
11	351 04.5	19 58.6	19.9	302 11.5	46.1		239 12.8	25.3		122 18.6	29.9		272 05.3	45	23 57.3	- 4
12	6 07.0	34 58.2	-12 19.0	317 12.2	+18 46.6		254 15.1	+22 25.3		137 21.2	-15 29.8		286 28.8	45	+23 56.9	- 6
13	21 09.4	49 57.7	18.1	332 12.9	47.1		269 17.5	25.3		152 23.8	29.8		300 52.3	45	23 56.3	- 8
14	36 11.9	64 57.3	17.2	347 13.7	47.5		284 19.8	25.3		167 26.3	29.8		315 15.8	45	23 55.5	- 10
15	51 14.4	79 56.9	.. 16.3	2 14.4	.. 48.0		299 22.2	.. 25.3		182 28.9	.. 29.7		329 39.3	46	23 54.5	- 11
16	66 16.8	94 56.5	15.4	17 15.1	48.5		314 24.6	25.3		197 31.5	29.7		344 02.9	47	23 53.4	- 13
17	81 19.3	109 56.1	14.5	32 15.8	48.9		329 26.9	25.2		212 34.1	29.7		358 26.6	46	23 52.1	- 14
18	96 21.8	124 55.6	-12 13.6	47 16.6	+18 49.4		344 29.3	+22 25.2		227 36.6	-15 29.6		12 50.2	47	+23 50.7	- 16
19	111 24.2	139 55.2	12.7	62 17.3	49.9		359 31.6	25.2		242 39.2	29.6		27 13.9	48	23 49.1	- 17
20	126 26.7	154 54.8	11.8	77 18.0	50.3		14 34.0	25.2		257 41.8	29.6		41 37.7	48	23 47.4	- 20
21	141 29.1	169 54.4	.. 10.8	92 18.7	.. 50.8		29 36.3	.. 25.2		272 44.4	.. 29.5		56 01.5	49	23 45.4	- 20
22	156 31.6	184 53.9	09.9	107 19.5	51.3		44 38.7	25.2		287 47.0	29.5		70 25.4	49	23 43.4	- 23
23	171 34.1	199 53.5	09.0	122 20.2	51.7		59 41.0	25.1		302 49.5	29.5		84 49.3	49	23 41.1	- 23
30	0	186 36.5	214 53.1	-12 08.1	137 20.9	+18 52.2	74 43.4	+22 25.1		317 52.1	-15 29.4		99 13.2	50	+23 38.8	- 26
1	201 39.0	229 52.7	07.2	152 21.6	52.7		89 45.7	25.1		332 54.7	29.4		113 37.2	51	23 36.2	- 27
2	216 41.5	244 52.3	06.3	167 22.4	53.1		104 48.1	25.1		347 57.3	29.3		128 01.3	51	23 33.5	- 28
3	231 43.9	259 51.8	.. 05.4	182 23.1	.. 53.6		119 50.4	.. 25.1		2 59.8	.. 29.3		142 25.4	51	23 30.7	- 31
4	246 46.4	274 51.4	04.5	197 23.8	54.1		134 52.8	25.1		18 02.4	29.3		156 49.5	53	23 27.6	- 31
5	261 48.9	289 51.0	03.6	212 24.5	54.5		149 55.1	25.1		33 05.0	29.2		171 13.8	53	23 24.5	- 33
6	276 51.3	304 50.6	-12 02.7	227 25.3	+18 55.0		164 57.5	+22 25.0		48 07.6	-15 29.2		185 38.1	53	+23 21.2	- 35
7	291 53.8	319 50.2	01.8	242 26.0	55.5		179 59.8	25.0		63 10.1	29.2		200 02.4	54	23 17.7	- 36
8	306 56.2	334 49.7	12 00.9	257 26.7	55.9		195 02.2	25.0		78 12.7	29.1		214 26.8	55	23 14.1	- 38
9	321 58.7	349 49.3	.. 11 59.9	272 27.4	.. 56.4		210 04.5	.. 25.0		93 15.3	.. 29.1		228 51.3	55	23 10.3	- 39
10	337 01.2	4 48.9	59.0	287 28.2	56.8		225 06.9	25.0		108 17.9	29.1		243 15.8	56	23 06.4	- 41
11	352 03.6	19 48.5	58.1	302 28.9	57.3		240 09.2	25.0		123 20.5	29.0		257 40.4	57	23 02.3	- 42
12	7 06.1	34 48.1	-11 57.2	317 29.6	+18 57.8		255 11.6	+22 25.0		138 23.0	-15 29.0		272 05.1	57	+22 58.1	- 43
13	22 08.6	49 47.7	56.3	332 30.3	58.2		270 13.9	24.9		153 25.6	28.9		286 29.8	58	22 53.8	- 45
14	37 11.0	64 47.2	55.4	347 31.1	58.7		285 16.3	24.9		168 28.2	28.9		300 54.6	59	22 49.3	- 47
15	52 13.5	79 46.8	.. 54.5	2 31.8	.. 59.2		300 18.6	.. 24.9		183 30.8	.. 28.9		315 19.5	59	22 44.6	- 48
16	67 16.0	94 46.4	53.5	17 32.5	18 59.6		315 21.0	24.9		198 33.3	28.8		329 44.4	61	22 39.8	- 49
17	82 18.4	109 46.0	52.6	32 33.2	19 00.1		330 23.3	24.9		213 35.9	28.8		344 09.5	60	22 34.9	- 51
18	97 20.9	124 45.6	-11 51.7	47 34.0	+19 00.5		345 25.7	+22 24.9		228 38.5	-15 28.8		358 34.5	62	+22 29.8	- 52
19	112 23.4	139 45.2	50.8	62 34.7	01.0		0 28.0	24.8		243 41.1	28.7		12 59.7	63	22 24.6	- 53
20	127 25.8	154 44.7	49.9	77 35.4	01.5		15 30.4	24.8		258 43.7	28.7		27 25.0	63	22 19.3	- 55
21	142 28.3	169 44.3	.. 49.0	92 36.1	.. 01.9		30 32.7	.. 24.8		273 46.2	.. 28.7		41 50.3	64	22 13.8	- 56
22	157 30.7	184 43.9	48.0	107 36.9	02.4		45 35.1	24.8		288 48.8	28.6		56 15.7	64	22 08.2	- 58
23	172 33.2	199 43.5	47.1	122 37.6	02.8		60 37.4	24.8		303 51.4	28.6		70 41.1	66	22 02.4	- 59
31	0	187 35.7	214 43.1	-11 46.2	137 38.3	+19 03.3	75 39.7	+22 24.8		318 54.0	-15 28.5		85 06.7	66	+21 56.5	- 60
1	202 38.1	229 42.7	45.3	152 39.0	03.8		90 42.1	24.8		333 56.6	28.5		99 32.3	67	21 50.5	- 62
2	217 40.6	244 42.3	44.3	167 39.8	04.2		105 44.4	24.7		348 59.1	28.5		113 58.0	68	21 44.3	- 63
3	232 43.1	259 41.8	.. 43.4	182 40.5	.. 04.7		120 46.8	.. 24.7		4 01.7	.. 28.4		128 23.8	69	21 38.0	- 64
4	247 45.5	274 41.4	42.5	197 41.2	05.1		135 49.1	24.7		19 04.3	28.4		142 49.7	70	21 31.6	- 65
5	262 48.0	289 41.0	41.6	212 41.9	05.6		150 51.5	24.7		34 06.9	28.4		157 15.7	70	21 25.1	- 67
6	277 50.5	304 40.6	-11 40.7	227 42.6	+19 06.0		165 53.8	+22 24.7		49 09.5	-15 28.3		171 41.7	71	+21 18.4	- 68
7	292 52.9	319 40.2	39.7	242 43.4	06.5		180 56.1	24.7		64 12.0	28.3		186 07.8	72	21 11.6	- 69
8	307 55.4	334 39.8	38.8	257 44.1	07.0		195 58.5	24.6		79 14.6	28.2		200 34.0	73	21 04.7	- 70
9	322 57.9	349 39.4	.. 37.9	272 44.8	.. 07.4		211 00.8	.. 24.6		94 17.2	.. 28.2		215 00.3	74	20 57.7	- 72
10	338 00.3	4 39.0	36.9	287 45.5	07.9		226 03.2	24.6		109 19.8	28.2		229 26.7	74	20 50.5	- 73
11	353 02.8	19 38.5	36.0	302 46.3	08.3		241 05.5	24.6		124 22.4	28.1		243 53.1	76	20 43.2	- 74
12	8 05.2	34 38.1	-11 35.1	317 47.0	+19 08.8		256 07.8	+22 24.6		139 25.0	-15 28.1		258 19.7	76	+20 35.8	- 75
13	23 07.7	49 37.7	34.2	332 47.7	09.2		271 10.2	24.6		154 27.5	28.1		272 46.3	77	20 28.3	- 76
14	38 10.2	64 37.3	33.2	347 48.4	09.7		286 12.5	24.5		169 30.1	28.0		287 13.0	78	20 20.7	- 78
15	53 12.6	79 36.9	.. 32.3	2 49.1	.. 10.1		301 14.9	.. 24.5		184 32.7	.. 28.0		301 39.8	79	20 12.9	- 78
16	68 15.1	94 36.5	31.4	17 49.9	10.6		316 17.2	24.5		199 35.3	27.9		316 06.7	80	20 05.1	- 80
17	83 17.6	109 36.1	30.4	32 50.6	11.0		331 19.5	24.5		214 37.9	27.9		330 33.7	81	19 57.1	- 81
18	98 20.0	124 35.7	-11 29.5	47 51.3	+19 11.5		346 21.9	+22 24.5		229 40.4	-15 27.9		345 00.8	81	+19 49.0	- 82
19	113 22.5	139 35.3	28.6	62 52.0	11.9		1 24.2	24.5		244 43.0	27.8		359 27.9	82	19 40.8	- 83
20	128 25.0	154 34.9	27.6	77 52.7	12.4		16 26.6	24.4		259 45.6	27.8		13 55.1	84	19 32.5	- 84
21	143 27.4	169 34.4	.. 26.7	92 53.5	.. 12.9		31 28.9	.. 24.4		274 48.2	.. 27.8		28 22.5	84	19 24.1	- 85
22	158 29.9	184 34.0	25.8	107 54.2	13.3		46 31.2	24.4		289 50.8	27.7		42 49.9	85		

G M T	☿		VENUS—3.5		MARS 1.7		JUPITER —1.8		SATURN 0.5		MOON			
	GHA		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'
1	0	188 34.8	214 33.2	-11 23.9	137 55.6	+19 14.2	76 35.9	+22 24.4	319 55.9	-15 27.7	71 45.0	86	+18 58.2	-88
1	1	203 37.3	229 32.8	23.0	152 56.4	14.7	91 38.2	24.4	334 58.5	27.6	86 12.6	88	18 49.4	-89
2	2	218 39.7	244 32.4	22.0	167 57.1	15.1	106 40.6	24.3	350 01.1	27.6	100 40.4	88	18 40.5	-91
3	3	233 42.2	259 32.0	21.1	182 57.8	15.6	121 42.9	24.3	5 03.7	27.5	115 08.2	90	18 31.4	-91
4	4	248 44.7	274 31.6	20.2	197 58.5	16.0	136 45.2	24.3	20 06.3	27.5	129 36.2	90	18 22.3	-92
5	5	263 47.1	289 31.2	19.2	212 59.2	16.5	151 47.6	24.3	35 08.9	27.5	144 04.2	91	18 13.1	-93
6	6	278 49.6	304 30.8	-11 18.3	228 00.0	+19 16.9	166 49.9	+22 24.3	50 11.4	-15 27.4	158 32.3	92	+18 03.8	-94
7	7	293 52.1	319 30.4	17.4	243 00.7	17.4	181 52.3	24.2	65 14.0	27.4	173 00.5	93	17 54.4	-95
8	8	308 54.5	334 30.0	16.4	258 01.4	17.8	196 54.6	24.2	80 16.6	27.4	187 28.8	94	17 44.9	-96
9	9	323 57.0	349 29.6	15.5	273 02.1	18.3	211 56.9	24.2	95 19.2	27.3	201 57.2	94	17 35.3	-97
10	10	338 59.5	4 29.2	14.5	288 02.8	18.7	226 59.3	24.2	110 21.8	27.3	216 25.6	95	17 25.6	-98
11	11	354 01.9	19 28.8	13.6	303 03.6	19.2	242 01.6	24.2	125 24.4	27.2	230 54.1	97	17 15.8	-98
12	12	9 04.4	34 28.4	-11 12.6	318 04.3	+19 19.6	257 03.9	+22 24.2	140 27.0	-15 27.2	245 22.8	97	+17 06.0	-100
13	13	24 06.8	49 28.0	11.7	333 05.0	20.1	272 06.2	24.1	155 29.5	27.2	259 51.5	98	16 56.0	-100
14	14	39 09.3	64 27.5	10.8	348 05.7	20.5	287 08.6	24.1	170 32.1	27.1	274 20.3	99	16 46.0	-101
15	15	54 11.8	79 27.1	9.8	3 06.4	20.9	302 10.9	24.1	185 34.7	27.1	288 49.2	99	16 35.9	-102
16	16	69 14.2	94 26.7	08.9	18 07.2	21.4	317 13.2	24.1	200 37.3	27.0	303 18.1	101	16 25.7	-103
17	17	84 16.7	109 26.3	07.9	33 07.9	21.8	332 15.6	24.1	215 39.9	27.0	317 47.2	101	16 15.4	-103
18	18	99 19.2	124 25.9	-11 07.0	48 08.6	+19 22.3	347 17.9	+22 24.1	230 42.5	-15 27.0	332 16.3	102	+16 05.1	-105
19	19	114 21.6	139 25.5	06.0	63 09.3	22.7	2 20.2	24.0	245 45.0	26.9	346 45.5	103	15 54.6	-105
20	20	129 24.1	154 25.1	05.1	78 10.0	23.2	17 22.6	24.0	260 47.6	26.9	1 14.8	104	15 44.1	-106
21	21	144 26.6	169 24.7	04.1	93 10.7	23.6	32 24.9	24.0	275 50.2	26.9	15 44.2	104	15 33.5	-106
22	22	159 29.0	184 24.3	03.2	108 11.5	24.1	47 27.2	24.0	290 52.8	26.8	30 13.6	105	15 22.9	-108
23	23	174 31.5	199 23.9	02.3	123 12.2	24.5	62 29.5	24.0	305 55.4	26.8	44 43.1	107	15 12.1	-108
2	0	189 34.0	214 23.5	-11 01.3	138 12.9	+19 25.0	77 31.9	+22 23.9	320 58.0	-15 26.7	59 12.8	106	+15 01.3	-108
1	1	204 36.4	229 23.1	11 00.4	153 13.6	25.4	92 34.2	23.9	336 00.6	26.7	73 42.4	108	14 50.5	-110
2	2	219 38.9	244 22.7	10 59.4	168 14.3	25.8	107 36.5	23.9	351 03.2	26.7	88 12.2	109	14 39.5	-110
3	3	234 41.3	259 22.3	58.5	183 15.1	26.3	122 38.9	23.9	6 05.7	26.6	102 42.1	109	14 28.5	-111
4	4	249 43.8	274 21.9	57.5	198 15.8	26.7	137 41.2	23.9	21 08.3	26.6	117 12.0	110	14 17.4	-111
5	5	264 46.3	289 21.5	56.6	213 16.5	27.2	152 43.5	23.9	36 10.9	26.6	131 42.0	111	14 06.3	-112
6	6	279 48.7	304 21.1	-10 55.6	228 17.2	+19 27.6	167 45.8	+22 23.8	51 13.5	-15 26.5	146 12.1	111	+13 55.1	-113
7	7	294 51.2	319 20.7	54.6	243 17.9	28.1	182 48.2	23.8	66 16.1	26.5	160 42.2	113	13 43.8	-113
8	8	309 53.7	334 20.3	53.7	258 18.6	28.5	197 50.5	23.8	81 18.7	26.4	175 12.5	113	13 32.5	-114
9	9	324 56.1	349 19.9	52.7	273 19.4	28.9	212 52.8	23.8	96 21.3	26.4	189 42.8	113	13 21.1	-115
10	10	339 58.6	4 19.5	51.8	288 20.1	29.4	227 55.1	23.8	111 23.9	26.4	204 13.1	115	13 09.6	-115
11	11	355 01.1	19 19.1	50.8	303 20.8	29.8	242 57.5	23.7	126 26.4	26.3	218 43.6	115	12 58.1	-115
12	12	10 03.5	34 18.7	-10 49.9	318 21.5	+19 30.3	257 59.8	+22 23.7	141 29.0	-15 26.3	233 14.1	116	+12 46.6	-116
13	13	25 06.0	49 18.3	48.9	333 22.2	30.7	273 02.1	23.7	156 31.6	26.2	247 44.7	117	12 35.0	-117
14	14	40 08.4	64 17.9	48.0	348 23.0	31.2	288 04.4	23.7	171 34.2	26.2	262 15.4	117	12 23.3	-118
15	15	55 10.9	79 17.5	47.0	3 23.7	31.6	303 06.8	23.7	186 36.8	26.2	276 46.1	118	12 11.5	-117
16	16	70 13.4	94 17.1	46.1	18 24.4	32.0	318 09.1	23.6	201 39.4	26.1	291 16.9	119	11 59.8	-119
17	17	85 15.8	109 16.7	45.1	33 25.1	32.5	333 11.4	23.6	216 42.0	26.1	305 47.8	119	11 47.9	-118
18	18	100 18.3	124 16.4	-10 44.1	48 25.8	+19 32.9	348 13.7	+22 23.6	231 44.6	-15 26.0	320 18.7	120	+11 36.1	-120
19	19	115 20.8	139 16.0	43.2	63 26.5	33.3	3 16.0	23.6	246 47.1	26.0	334 49.7	121	11 24.1	-119
20	20	130 23.2	154 15.6	42.2	78 27.3	33.8	18 18.4	23.6	261 49.7	26.0	349 20.8	121	11 12.2	-121
21	21	145 25.7	169 15.2	41.3	93 28.0	34.2	33 20.7	23.5	276 52.3	25.9	3 51.9	122	11 00.1	-120
22	22	160 28.2	184 14.8	40.3	108 28.7	34.7	48 23.0	23.5	291 54.9	25.9	18 23.1	123	10 48.1	-121
23	23	175 30.6	199 14.4	39.3	123 29.4	35.1	63 25.3	23.5	306 57.5	25.9	32 54.4	123	10 36.0	-122
3	0	190 33.1	214 14.0	-10 38.4	138 30.1	+19 35.5	78 27.7	+22 23.5	322 00.1	-15 25.8	47 25.7	124	+10 23.8	-122
1	1	205 35.6	229 13.6	37.4	153 30.8	36.0	93 30.0	23.5	337 02.7	25.8	61 57.1	125	10 11.6	-122
2	2	220 38.0	244 13.2	36.5	168 31.5	36.4	108 32.3	23.5	352 05.3	25.7	76 28.6	125	9 59.4	-123
3	3	235 40.5	259 12.8	35.5	183 32.3	36.8	123 34.6	23.4	7 07.9	25.7	91 00.1	125	9 47.1	-123
4	4	250 42.9	274 12.4	34.5	198 33.0	37.3	138 36.9	23.4	22 10.5	25.7	105 31.6	127	9 34.8	-123
5	5	265 45.4	289 12.0	33.6	213 33.7	37.7	153 39.2	23.4	37 13.0	25.6	120 03.3	126	9 22.5	-124
6	6	280 47.9	304 11.6	-10 32.6	228 34.4	+19 38.2	168 41.6	+22 23.4	52 15.6	-15 25.6	134 34.9	128	+ 9 10.1	-124
7	7	295 50.3	319 11.2	31.6	243 35.1	38.6	183 43.9	23.4	67 18.2	25.5	149 06.7	128	8 57.7	-125
8	8	310 52.8	334 10.8	30.7	258 35.8	39.0	198 46.2	23.3	82 20.8	25.5	163 38.5	128	8 45.2	-125
9	9	325 55.3	349 10.4	29.7	273 36.6	39.5	213 48.5	23.3	97 23.4	25.5	178 10.3	129	8 32.7	-125
10	10	340 57.7	4 10.0	28.7	288 37.3	39.9	228 50.8	23.3	112 26.0	25.4	192 42.2	130	8 20.2	-125
11	11	356 00.2	19 09.7	27.8	303 38.0	40.3	243 53.2	23.3	127 28.6	25.4	207 14.2	130	8 07.7	-126
12	12	11 02.7	34 09.3	-10 26.8	318 38.7	+19 40.8	258 55.5	+22 23.3	142 31.2	-15 25.3	221 46.2	131	+ 7 55.1	-126
13	13	26 05.1	49 08.9	25.8	333 39.4	41.2	273 57.8	23.2	157 33.8	25.3	236 18.3	131	7 42.5	-126
14	14	41 07.6	64 08.5	24.9	348 40.1	41.6	289 00.1	23.2	172 36.4	25.3	250 50.4	131	7 29.9	-127
15	15	56 10.1	79 08.1	23.9	3 40.8	42.1	304 02.4	23.2	187 39.0	25.2	265 22.5	132	7 17.2	-127
16	16	71 12.5	94 07.7	22.9	18 41.6	42.5	319 04.7	23.2	202 41.5	25.2	279 54.7	133	7 04.5	-127
17	17	86 15.0	109 07.3	21.9	33 42.3	42.9	334 07.0	23.2	217 44.1	25.1	294 27.0	133	6 51.8	-127
18	18	101 17.4	124 06.9	-10 21.0	48 43.0	+19 43.4	349 09.4	+22 23.1	232 46.7	-15 25.1	308 59.3	134	+ 6 39.1	-127
19	19	116 19.9	139 06.5	20.0	63 43.7	43.8	4 11.7	23.1	247 49.3	25.1	323 31.7	134	6 26.4	-128
20	20	131 22.4	154 06.1	19.0	78 44.4	44.2	19 14.0	23.1	262 51.9	25.0	338 04.1	134	6 13.6	-128
21	21	146 24.8	169 05.8	18.1	93 45.1	44.7	34 16.3	23.1	277 54.5	25.0	352 36.5	135	6 00.8	-128
22	22	161 27.3	184 05.4	17.1	108 45.8	45.1	49 18.6	23.0	292 57.1	25.0	7 09.0	135	5 48.0	-128
23	23	176 29.8	199 05.0	16.1	123 46.6	45.5	64 20.9	23.0	307 59.7	24.9	21 41.5	136	5 35.2	-129
24	24	191 32.2	214 04.6	-10 15.1	138 47.3	+19 45.9	79 23.2	+22 23.0	323 02.3	-15 24.9	36 14.1	136	+ 5 22.3	-128
code	—	—	- 4	+ 10	+ 7	+ 4	+ 23	0	+ 26	+ 1				

G M T	☿		VENUS -3.5			MARS 1.7			JUPITER -1.8			SATURN 0.4			MOON			
	GHA		GHA	Dec.		GHA	Dec.		GHA	Dec.		GHA	Dec.		GHA	code	Dec.	code
h	°	'	°	'	°	°	'	°	°	'	°	°	'	°	°	'	°	'
4	0	191 32.2	214 04.6	-10 15.1		138 47.3	+19 45.9		79 23.2	+22 23.0		323 02.3	-15 24.9		36 14.1	136 +	5 22.3	-128
1	206 34.7	229 04.2		14.2		153 48.0	46.4		94 25.6	23.0		338 04.9	24.8		50 46.7	136	5 09.5	-129
2	221 37.2	244 03.8		13.2		168 48.7	46.8		109 27.9	23.0		353 07.5	24.8		65 19.3	137	4 56.6	-129
3	236 39.6	259 03.4	..	12.2		183 49.4	.. 47.2		124 30.2	.. 22.9		8 10.1	.. 24.8		79 52.0	137	4 43.7	-129
4	251 42.1	274 03.0		11.2		198 50.1	47.7		139 32.5	22.9		23 12.7	24.7		94 24.7	138	4 30.8	-129
5	266 44.5	289 02.6		10.3		213 50.8	48.1		154 34.8	22.9		38 15.2	24.7		108 57.5	138	4 17.9	-129
6	281 47.0	304 02.3	-10 09.3			228 51.6	+19 48.5		169 37.1	+22 22.9		53 17.8	-15 24.6		123 30.3	138 +	4 05.0	-129
7	296 49.5	319 01.9		08.3		243 52.3	49.0		184 39.4	22.9		68 20.4	24.6		138 03.1	139	3 52.1	-129
8	311 51.9	334 01.5		07.3		258 53.0	49.4		199 41.7	22.8		83 23.0	24.6		152 36.0	139	3 39.2	-130
9	326 54.4	349 01.1	..	06.3		273 53.7	.. 49.8		214 44.0	.. 22.8		98 25.6	.. 24.5		167 08.9	139	3 26.2	-129
10	341 56.9	4 00.7		05.4		288 54.4	50.2		229 46.3	22.8		113 28.2	24.5		181 41.8	140	3 13.3	-130
11	356 59.3	19 00.3		04.4		303 55.1	50.7		244 48.7	22.8		128 30.8	24.4		196 14.8	140	3 00.3	-129
12	12 01.8	33 59.9	-10 03.4			318 55.8	+19 51.1		259 51.0	+22 22.8		143 33.4	-15 24.4		210 47.8	140 +	2 47.4	-130
13	27 04.3	48 59.6		02.4		333 56.6	51.5		274 53.3	22.7		158 36.0	24.4		225 20.8	141	2 34.4	-130
14	42 06.7	63 59.2		01.4		348 57.3	51.9		289 55.6	22.7		173 38.6	24.3		239 53.9	141	2 21.4	-129
15	57 09.2	78 58.8	.. 10 00.5			3 58.0	.. 52.4		304 57.9	.. 22.7		188 41.2	.. 24.3		254 27.0	141	2 08.5	-130
16	72 11.7	93 58.4	9 59.5			18 58.7	52.8		320 00.2	22.7		203 43.8	24.2		269 00.1	141	1 55.5	-130
17	87 14.1	108 58.0		58.5		33 59.4	53.2		335 02.5	22.6		218 46.4	24.2		283 33.2	142	1 42.5	-129
18	102 16.6	123 57.6	- 9 57.5			49 00.1	+19 53.6		350 04.8	+22 22.6		233 49.0	-15 24.2		298 06.4	142 +	1 29.6	-130
19	117 19.0	138 57.3		56.5		64 00.8	54.1		5 07.1	22.6		248 51.6	24.1		312 39.6	142	1 16.6	-130
20	132 21.5	153 56.9		55.5		79 01.5	54.5		20 09.4	22.6		263 54.2	24.1		327 12.8	142	1 03.6	-129
21	147 24.0	168 56.5	.. 54.6			94 02.2	.. 54.9		35 11.7	.. 22.6		278 56.8	.. 24.0		341 46.0	143	0 50.7	-130
22	162 26.4	183 56.1		53.6		109 03.0	55.3		50 14.0	22.5		293 59.4	24.0		356 19.3	142	0 37.7	-129
23	177 28.9	198 55.7		52.6		124 03.7	55.8		65 16.3	22.5		309 01.9	24.0		10 52.5	143	0 24.8	-129
5	0	192 31.4	213 55.3	- 9 51.6		139 04.4	+19 56.2		80 18.6	+22 22.5		324 04.5	-15 23.9		25 25.8	143 +	0 11.9	-130
1	207 33.8	228 55.0		50.6		154 05.1	56.6		95 20.9	22.5		339 07.1	23.9		39 59.1	144	0 01.1	-129
2	222 36.3	243 54.6		49.6		169 05.8	57.0		110 23.2	22.5		354 09.7	23.8		54 32.5	143	0 14.0	-129
3	237 38.8	258 54.2	.. 48.6			184 06.5	.. 57.5		125 25.5	.. 22.4		9 12.3	.. 23.8		69 05.8	144	0 26.9	-129
4	252 41.2	273 53.8		47.6		199 07.2	57.9		140 27.9	22.4		24 14.9	23.8		83 39.2	144	0 39.8	-129
5	267 43.7	288 53.4		46.7		214 07.9	58.3		155 30.2	22.4		39 17.5	23.7		98 12.6	144	0 52.7	-129
6	282 46.1	303 53.0	- 9 45.7			229 08.7	+19 58.7		170 32.5	+22 22.4		54 20.1	-15 23.7		112 46.0	144 -	1 05.6	-128
7	297 48.6	318 52.7		44.7		244 09.4	59.1		185 34.8	22.3		69 22.7	23.6		127 19.4	144	1 18.4	-129
8	312 51.1	333 52.3		43.7		259 10.1	19 59.6		200 37.1	22.3		84 25.3	23.6		141 52.8	145	1 31.3	-128
9	327 53.5	348 51.9	.. 42.7			274 10.8	.. 20 00.0		215 39.4	.. 22.3		99 27.9	.. 23.5		156 26.3	144	1 44.1	-128
10	342 56.0	3 51.5		41.7		289 11.5	00.4		230 41.7	22.3		114 30.5	23.5		170 59.7	145	1 56.9	-128
11	357 58.5	18 51.1		40.7		304 12.2	00.8		245 44.0	22.3		129 33.1	23.5		185 33.2	144	2 09.7	-128
12	13 00.9	33 50.8	- 9 39.7			319 12.9	+20 01.2		260 46.3	+22 22.2		144 35.7	-15 23.4		200 06.6	145 -	2 22.5	-128
13	28 03.4	48 50.4		38.7		334 13.6	01.7		275 48.6	22.2		159 38.3	23.4		214 40.1	145	2 35.3	-127
14	43 05.9	63 50.0		37.7		349 14.3	02.1		290 50.9	22.2		174 40.9	23.3		229 13.6	145	2 48.0	-127
15	58 08.3	78 49.6	.. 36.7			4 15.1	.. 02.5		305 53.2	.. 22.2		189 43.5	.. 23.3		243 47.1	145	3 00.7	-127
16	73 10.8	93 49.2		35.7		19 15.8	02.9		320 55.5	22.1		204 46.1	23.3		258 20.6	145	3 13.4	-127
17	88 13.3	108 48.9		34.8		34 16.5	03.3		335 57.8	22.1		219 48.7	23.2		272 54.1	145	3 26.1	-127
18	103 15.7	123 48.5	- 9 33.8			49 17.2	+20 03.8		351 00.1	+22 22.1		234 51.3	-15 23.2		287 27.6	146 -	3 38.8	-126
19	118 18.2	138 48.1		32.8		64 17.9	04.2		6 02.4	22.1		249 53.9	23.1		302 01.2	145	3 51.4	-126
20	133 20.6	153 47.7		31.8		79 18.6	04.6		21 04.7	22.1		264 56.5	23.1		316 34.7	145	4 04.0	-126
21	148 23.1	168 47.4	.. 30.8			94 19.3	.. 05.0		36 07.0	.. 22.0		279 59.1	.. 23.1		331 08.2	145	4 16.6	-126
22	163 25.6	183 47.0		29.8		109 20.0	05.4		51 09.3	22.0		295 01.7	23.0		345 41.7	146	4 29.2	-125
23	178 28.0	198 46.6		28.8		124 20.7	05.8		66 11.6	22.0		310 04.3	23.0		0 15.3	145	4 41.7	-125
6	0	193 30.5	213 46.2	- 9 27.8		139 21.4	+20 06.3		81 13.9	+22 22.0		325 06.9	-15 22.9		14 48.8	146 -	4 54.2	-125
1	208 33.0	228 45.9		26.8		154 22.1	06.7		96 16.1	21.9		340 09.5	22.9		29 22.3	145	5 06.7	-124
2	223 35.4	243 45.5		25.8		169 22.9	07.1		111 18.4	21.9		355 12.1	22.9		43 55.9	145	5 19.1	-124
3	238 37.9	258 45.1	.. 24.8			184 23.6	.. 07.5		126 20.7	.. 21.9		10 14.7	.. 22.8		58 29.4	145	5 31.5	-124
4	253 40.4	273 44.7		23.8		199 24.3	07.9		141 23.0	21.9		25 17.3	22.8		73 02.9	145	5 43.9	-124
5	268 42.8	288 44.4		22.8		214 25.0	08.3		156 25.3	21.8		40 19.9	22.7		87 36.4	145	5 56.3	-123
6	283 45.3	303 44.0	- 9 21.8			229 25.7	+20 08.7		171 27.6	+22 21.8		55 22.5	-15 22.7		102 09.9	146 -	6 08.6	-123
7	298 47.8	318 43.6		20.8		244 26.4	09.2		186 29.9	21.8		70 25.1	22.6		116 43.5	145	6 20.9	-122
8	313 50.2	333 43.2		19.8		259 27.1	09.6		201 32.2	21.8		85 27.7	22.6		131 17.0	145	6 33.1	-122
9	328 52.7	348 42.9	.. 18.8			274 27.8	.. 10.0		216 34.5	.. 21.8		100 30.3	.. 22.6		145 50.5	145	6 45.3	-122
10	343 55.1	3 42.5		17.8		289 28.5	10.4		231 36.8	21.7		115 32.9	22.5		160 24.0	145	6 57.5	-121
11	358 57.6	18 42.1		16.8		304 29.2	10.8		246 39.1	21.7		130 35.5	22.5		174 57.5	144	7 09.6	-121
12	14 00.1	33 41.7	- 9 15.8			319 29.9	+20 11.2		261 41.4	+22 21.7		145 38.1	-15 22.4		189 30.9	145 -	7 21.7	-121
13	29 02.5	48 41.4		14.7		334 30.7	11.6		276 43.7	21.7		160 40.7	22.4		204 04.4	145	7 33.8	-120
14	44 05.0	63 41.0		13.7		349 31.4	12.0		291 46.0	21.6		175 43.3	22.4		218 37.9	144	7 45.8	-120
15	59 07.5	78 40.6	.. 12.7			4 32.1	.. 12.5		306 48.3	.. 21.6		190 45.9	.. 22.3		233 11.3	145	7 57.8	-119
16	74 09.9	93 40.2		11.7		19 32.8	12.9		321 50.6	21.6		205 48.5	22.3		247 44.8	144	8 09.7	-119
17	89 12.4	108 39.9		10.7		34 33.5	13.3		336 52.8	21.6		220 51.1	22.2		262 18.2	144	8 21.6	-119
18	104 14.9	123 39.5	- 9 09.7			49 34.2	+20 13.7		351 55.1	+22 21.5		235 53.7	-15 22.2		276 51.6	144 -	8 33.5	-118
19	119 17.3	138 39.1	</															

G M T	SUN		STARS				Lat.	Sunrise	Twit. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS						
	GHA	Dec.	No.	Name	SHA	Dec.								Sun's Low'r Limb	Venus	Mars				
										4	5	6	7				Add	Add	Add	
h	°	'	°	'	°	'	N	h	m	h	m	h	m	h	m	Alt.	°	'	°	'
4	0	179 09.5 + 5	18.7	7	Acamar	315 51.7	-40 29.1	72	4 39	////	15 40	17 35	19 32	21 38						
	1	194 09.7	19.7	5	Achernar	335 59.6	-57 27.8	70	4 48	////	15 43	17 30	19 17	21 09						
	2	209 09.9	20.6	30	Acruz	173 57.6	-62 51.3	68	4 55	////	15 45	17 25	19 06	20 48						
	3	224 10.1 ..	21.6	19	Adhara	255 46.8	-28 54.9	66	5 02	0 39	15 47	17 22	18 56	20 32						
	4	239 10.2	22.5	10	Aldebaran	291 39.7	+16 25.3	64	5 07	1 42	15 49	17 19	18 48	20 18						
	5	254 10.4	23.5					62	5 12	2 13	15 50	17 16	18 42	20 07						
	6	269 10.6 + 5	24.5	32	Alioth	166 58.2	+56 12.0	60	5 16	2 35	15 51	17 14	18 36	19 57						
	7	284 10.8	25.4	34	Alkaid	153 32.6	+49 31.9	58	5 19	2 52	15 52	17 12	18 31	19 49						
	8	299 11.0	26.4	55	Al Na'ir	28 38.7	-47 10.5	56	5 22	3 06	15 53	17 10	18 26	19 42						
	9	314 11.2 ..	27.3	15	Alnilam	276 30.7	- 1 13.8	54	5 25	3 17	15 54	17 09	18 22	19 35						
	10	329 11.4	28.3	25	Alphard	218 38.8	- 8 28.1	52	5 28	3 28	15 55	17 07	18 19	19 29						
	11	344 11.5	29.2					50	5 30	3 36	15 55	17 06	18 15	19 24						
	12	359 11.7 + 5	30.2	41	Alphecca	126 47.6	+26 51.6	45	5 35	3 54	15 57	17 03	18 08	19 13	Moon's Lower Limb					
	13	14 11.9	31.1	1	Alpheratz	358 29.1	+28 50.6	40	5 39	4 07	15 58	17 01	18 02	19 03	Add					
	14	29 12.1	32.1	51	Altair	62 50.8	+ 8 44.8	35	5 42	4 17	15 59	16 59	17 57	18 55	Alt.	4	5	6		
	15	44 12.3 ..	33.1	2	Ankaa	353 59.0	-42 32.9	30	5 46	4 26	16 00	16 57	17 53	18 49	0					
	16	59 12.5	34.0	42	Antares	113 19.6	-26 20.1	20	5 51	4 38	16 02	16 54	17 45	18 36	0	14.7	14.0	13.5		
	17	74 12.6	35.0					10	5 55	4 46	16 03	16 51	17 38	18 26	4	14.7	14.0	13.5		
	18	89 12.8 + 5	35.9	37	Arcturus	146 35.2	+19 24.6	0	6 00	4 51	16 05	16 49	17 32	18 16	8	14.7	14.0	13.5		
	19	104 13.0	36.9	43	Atria	109 00.3	-68 56.8	10	6 04	4 54	16 06	16 46	17 26	18 07	12	14.7	14.1	13.6		
	20	119 13.2	37.8	22	Avior	234 35.8	-59 22.3	20	6 08	4 55	16 08	16 43	17 19	17 56	16	14.7	14.1	13.6		
	21	134 13.4 ..	38.8	13	Bellatrix	279 18.9	+ 6 18.6	30	6 13	4 53	16 09	16 41	17 12	17 45	20	14.7	14.1	13.6		
	22	149 13.6	39.7	16	Betelge'se	271 48.6	+ 7 23.9	35	6 15	4 50	16 10	16 39	17 08	17 38	24	14.7	14.1	13.6		
	23	164 13.8	40.7					40	6 18	4 47	16 11	16 37	17 03	17 31	28	14.8	14.2	13.7		
				17	Canopus	264 15.6	-52 40.5	45	6 22	4 43	16 13	16 35	16 58	17 22	32	14.8	14.2	13.8		
5	0	179 13.9 + 5	41.6	12	Capella	281 39.2	+45 57.4	50	6 26	4 37	16 14	16 32	16 51	17 11	36	14.8	14.3	13.9		
	1	194 14.1	42.6	53	Deneb	50 01.4	+45 07.0	52	6 28	4 34	16 15	16 31	16 48	17 06	40	14.8	14.3	13.9		
	2	209 14.3	43.5	28	Denebola	183 17.8	+14 49.1	54	6 30	4 30	16 16	16 30	16 45	17 01	44	14.9	14.4	14.0		
	3	224 14.5 ..	44.5	4	Diphda	349 39.9	-18 13.9	56	6 32	4 26	16 16	16 28	16 41	16 55	48	14.9	14.5	14.1		
	4	239 14.7	45.4					58	6 34	4 21	16 17	16 27	16 37	16 49	52	14.9	14.5	14.2		
	5	254 14.9	46.4	27	Dubhe	194 44.4	+61 59.6	60	6 37	4 15	16 18	16 25	16 33	16 41	56	15.0	14.6	14.3		
	6	269 15.0 + 5	47.4	14	Elnath	279 07.9	+28 34.3	S							60	15.0	14.7	14.4		
	7	284 15.2	48.3	47	Eltanin	91 06.3	+51 29.3								64	15.1	14.7	14.5		
	8	299 15.4	49.3	54	Enif	34 30.1	+ 9 40.1	Lat.	Sunset	Twit. ends	Moonset				68	15.1	14.8	14.6		
	9	314 15.6 ..	50.2	56	Fomalhaut	16 12.3	-29 51.5	N			4	5	6	7	72	15.2	14.9	14.7		
	10	329 15.8	51.2								h	m	h	m	h	m	h	m		
	11	344 16.0	52.1	31	Gacrux	172 49.1	-56 52.0	72	19 30	////	4 36	4 16	3 55	3 30	76	15.2	15.0	14.8		
	12	359 16.1 + 5	53.1	29	Gienah	176 36.9	-17 17.9	70	19 21	////	4 31	4 17	4 03	3 47	80	15.3	15.1	14.9		
	13	14 16.3	54.0	35	Hadar	149 49.4	-60 09.6	68	19 13	////	4 26	4 18	4 09	4 00	84	15.3	15.1	15.0		
	14	29 16.5	55.0	6	Hamal	328 50.4	+23 15.1	66	19 06	////	4 22	4 18	4 15	4 11	88	15.3	15.2	15.1		
	15	44 16.7 ..	55.9	48	Kaus Aust.	84 41.6	-34 24.4	64	19 01	22 36	4 19	4 19	4 19	4 20	90	Add to table, back cover				
	16	59 16.9	56.9					62	18 56	22 01	4 16	4 20	4 23	4 28		Moon's Upper Limb				
	17	74 17.0	57.8	40	Kochab	137 16.8	+74 20.0	60	18 52	21 38	4 13	4 20	4 27	4 35	Alt.	4	5	6		
	18	89 17.2 + 5	58.8	57	Markab	14 22.1	+14 57.8	58	18 48	21 19	4 10	4 20	4 30	4 41	0	16.1	16.4	16.7		
	19	104 17.4	5 59.7	8	Menkar	315 01.0	+ 3 54.9	56	18 45	21 05	4 08	4 21	4 33	4 46	4	16.1	16.4	16.7		
	20	119 17.6	6 00.7	36	Menkent	148 58.7	-36 09.2	54	18 42	20 53	4 07	4 21	4 36	4 51	8	16.0	16.4	16.7		
	21	134 17.8 ..	01.6	24	Miapl'dus	221 48.7	-69 32.3	52	18 39	20 42	4 05	4 22	4 38	4 55	12	16.0	16.4	16.7		
	22	149 18.0	02.6					50	18 37	20 33	4 03	4 22	4 41	4 59	16	16.0	16.4	16.6		
	23	164 18.1	03.5					45	18 32	20 15	4 00	4 22	4 45	5 08	20	16.0	16.4	16.6		
				9	Mirfak	309 43.3	+49 42.3	40	18 28	20 02	3 57	4 23	4 49	5 15	24	16.0	16.3	16.6		
				50	Nunki	76 52.3	-26 21.2	40	18 28	20 02	3 57	4 23	4 49	5 15	28	16.0	16.3	16.5		
				52	Peacock	54 28.0	-56 52.6	35	18 24	19 51	3 54	4 23	4 52	5 22	32	15.9	16.2	16.4		
				21	Pollux	244 20.9	+28 08.1	30	18 21	19 42	3 52	4 24	4 55	5 27	36	15.9	16.2	16.4		
				20	Procyon	245 45.3	+ 5 20.3	20	18 15	19 29	3 48	4 25	5 00	5 37	40	15.9	16.1	16.3		
								10	18 11	19 21	3 45	4 25	5 05	5 45	44	15.8	16.1	16.2		
				46	R'alhague	96 46.8	+12 35.3	0	18 06	19 15	3 41	4 26	5 09	5 53	48	15.8	16.0	16.1		
				26	Regulus	208 29.6	+12 11.0	10	18 02	19 12	3 38	4 26	5 14	6 01	52	15.8	15.9	16.0		
				11	Rigel	281 54.1	- 8 15.2	20	17 58	19 11	3 34	4 27	5 18	6 10	56	15.6	15.7	15.8		
				38	Rigel Kent.	140 50.9	-60 39.2	30	17 53	19 12	3 30	4 27	5 24	6 20	60	15.6	15.6	15.7		
				44	Sabik	103 02.4	-15 40.4	35	17 50	19 14	3 28	4 28	5 27	6 25	64	15.6	15.6	15.7		
								40	17 47	19 17	3 25	4 28	5 30	6 32	68	15.6	15.6	15.7		
				3	Schedar	350 31.0	+56 17.6	45	17 43	19 20	3 22	4 29	5 34	6 39	72	15.5	15.5	15.4		
				45	Shaula	97 21.0	-37 04.3	50	17 39	19 26	3 18	4 29	5 39	6 48	76	15.5	15.4	15.3		
				18	Sirius	259 12.2	-16 39.4	52	17 3											

G M T	☿		VENUS - 3.5			MARS 1.7			JUPITER - 1.8			SATURN 0.4			MOON			
	GHA		GHA	Dec.		GHA	Dec.		GHA	Dec.		GHA	Dec.		GHA	code	Dec.	code
7 0	194 29.6		213 37.3	- 9	03.7	139 38.4	+20	16.1	82 08.9	+22	21.4	326 09.3	-15	21.9	4 11.8	144 -	9 43.7	-115
1	209 32.1		228 36.9		02.7	154 39.1		16.6	97 11.2		21.4	341 11.9		21.9	18 45.2	143	9 55.2	-115
2	224 34.6		243 36.5		01.6	169 39.9		17.0	112 13.5		21.3	356 14.5		21.9	33 18.5	142	10 06.7	-114
3	239 37.0		258 36.2		9 00.6	184 40.6		17.4	127 15.7		21.3	11 17.1		21.8	47 51.7	143	10 18.1	-114
4	254 39.5		273 35.8		8 59.6	199 41.3		17.8	142 18.0		21.3	26 19.7		21.8	62 25.0	143	10 29.5	-113
5	269 42.0		288 35.4		58.6	214 42.0		18.2	157 20.3		21.3	41 22.3		21.7	76 58.3	142	10 40.8	-113
6	284 44.4		303 35.0		8 57.6	229 42.7	+20	18.6	172 22.6	+22	21.2	56 24.9	-15	21.7	91 31.5	142	-10 52.1	-112
7	299 46.9		318 34.7		56.6	244 43.4		19.0	187 24.9		21.2	71 27.5		21.7	106 04.7	142	11 03.3	-112
8	314 49.4		333 34.3		55.6	259 44.1		19.4	202 27.2		21.2	86 30.1		21.6	120 37.9	141	11 14.5	-111
9	329 51.8		348 33.9		54.6	274 44.8		19.8	217 29.5		21.2	101 32.7		21.6	135 11.0	142	11 25.6	-111
10	344 54.3		3 33.6		53.5	289 45.5		20.2	232 31.8		21.2	116 35.3		21.5	149 44.2	141	11 36.7	-110
11	359 56.7		18 33.2		52.5	304 46.2		20.6	247 34.0		21.1	131 37.9		21.5	164 17.3	141	11 47.7	-109
12	14 59.2		33 32.8	- 8	51.5	319 46.9	+20	21.0	262 36.3	+22	21.1	146 40.5	-15	21.4	178 50.4	141	-11 58.6	-109
13	30 01.7		48 32.5		50.5	334 47.6		21.4	277 38.6		21.1	161 43.1		21.4	193 23.5	141	12 09.5	-109
14	45 04.1		63 32.1		49.5	349 48.3		21.8	292 40.9		21.1	176 45.7		21.4	207 56.6	140	12 20.4	-107
15	60 06.6		78 31.7		48.5	4 49.0		22.2	307 43.2		21.0	191 48.3		21.3	222 29.6	140	12 31.1	-108
16	75 09.1		93 31.4		47.4	19 49.7		22.6	322 45.5		21.0	206 50.9		21.3	237 02.6	140	12 41.9	-106
17	90 11.5		108 31.0		46.4	34 50.5		23.0	337 47.7		21.0	221 53.5		21.2	251 35.6	139	12 52.5	-106
18	105 14.0		123 30.6	- 8	45.4	49 51.2	+20	23.4	352 50.0	+22	21.0	236 56.1	-15	21.2	266 08.5	140	-13 03.1	-105
19	120 16.5		138 30.3		44.4	64 51.9		23.8	7 52.3		20.9	251 58.7		21.1	280 41.5	139	13 13.6	-105
20	135 18.9		153 29.9		43.4	79 52.6		24.2	22 54.6		20.9	267 01.3		21.1	295 14.4	139	13 24.1	-104
21	150 21.4		168 29.5		42.4	94 53.3		24.7	37 56.9		20.9	282 03.9		21.1	309 47.3	138	13 34.5	-103
22	165 23.8		183 29.2		41.3	109 54.0		25.1	52 59.2		20.9	297 06.6		21.0	324 20.1	138	13 44.8	-103
23	180 26.3		198 28.8		40.3	124 54.7		25.5	68 01.4		20.8	312 09.2		21.0	338 52.9	138	13 55.1	-102
8 0	195 28.8		213 28.4	- 8	39.3	139 55.4	+20	25.9	83 03.7	+22	20.8	327 11.8	-15	20.9	353 25.7	138	-14 05.3	-101
1	210 31.2		228 28.1		38.3	154 56.1		26.3	98 06.0		20.8	342 14.4		20.9	7 58.5	138	14 15.4	-101
2	225 33.7		243 27.7		37.2	169 56.8		26.7	113 08.3		20.8	357 17.0		20.9	22 31.3	137	14 25.5	-100
3	240 36.2		258 27.3		36.2	184 57.5		27.1	128 10.6		20.7	12 19.6		20.8	37 04.0	137	14 35.5	-100
4	255 38.6		273 27.0		35.2	199 58.2		27.5	143 12.8		20.7	27 22.2		20.8	51 36.7	136	14 45.5	-98
5	270 41.1		288 26.6		34.2	214 58.9		27.9	158 15.1		20.7	42 24.8		20.7	66 09.3	137	14 55.3	-98
6	285 43.6		303 26.2	- 8	33.2	229 59.6	+20	28.3	173 17.4	+22	20.6	57 27.4	-15	20.7	80 42.0	136	-15 05.1	-98
7	300 46.0		318 25.9		32.1	245 00.3		28.7	188 19.7		20.6	72 30.0		20.6	95 14.6	135	15 14.9	-96
8	315 48.5		333 25.5		31.1	260 01.0		29.1	203 22.0		20.6	87 32.6		20.6	109 47.1	136	15 24.5	-96
9	330 51.0		348 25.2		30.1	275 01.7		29.5	218 24.2		20.6	102 35.2		20.6	124 19.7	135	15 34.1	-95
10	345 53.4		3 24.8		29.1	290 02.4		29.9	233 26.5		20.5	117 37.8		20.5	138 52.2	134	15 43.6	-94
11	0 55.9		18 24.4		28.0	305 03.1		30.2	248 28.8		20.5	132 40.4		20.5	153 24.6	135	15 53.0	-94
12	15 58.3		33 24.1	- 8	27.0	320 03.8	+20	30.6	263 31.1	+22	20.5	147 43.0	-15	20.4	167 57.1	134	-16 02.4	-93
13	31 00.8		48 23.7		26.0	335 04.5		31.0	278 33.4		20.5	162 45.6		20.4	182 29.5	134	16 11.7	-92
14	46 03.3		63 23.3		24.9	350 05.3		31.4	293 35.6		20.4	177 48.2		20.3	197 01.9	133	16 20.9	-91
15	61 05.7		78 23.0		23.9	5 06.0		31.8	308 37.9		20.4	192 50.8		20.3	211 34.2	134	16 30.0	-91
16	76 08.2		93 22.6		22.9	20 06.7		32.2	323 40.2		20.4	207 53.5		20.3	226 06.6	133	16 39.1	-90
17	91 10.7		108 22.3		21.9	35 07.4		32.6	338 42.5		20.4	222 56.1		20.2	240 38.9	132	16 48.1	-89
18	106 13.1		123 21.9	- 8	20.8	50 08.1	+20	33.0	353 44.7	+22	20.3	237 58.7	-15	20.2	255 11.1	132	-16 57.0	-88
19	121 15.6		138 21.5		19.8	65 08.8		33.4	8 47.0		20.3	253 01.3		20.1	269 43.3	132	17 05.8	-87
20	136 18.1		153 21.2		18.8	80 09.5		33.8	23 49.3		20.3	268 03.9		20.1	284 15.5	132	17 14.5	-87
21	151 20.5		168 20.8		17.7	95 10.2		34.2	38 51.6		20.3	283 06.5		20.0	298 47.7	131	17 23.2	-86
22	166 23.0		183 20.4		16.7	110 10.9		34.6	53 53.8		20.2	298 09.1		20.0	313 19.8	131	17 31.8	-85
23	181 25.5		198 20.1		15.7	125 11.6		35.0	68 56.1		20.2	313 11.7		20.0	327 51.9	131	17 40.3	-84
9 0	196 27.9		213 19.7	- 8	14.7	140 12.3	+20	35.4	83 58.4	+22	20.2	328 14.3	-15	19.9	342 24.0	130	-17 48.7	-83
1	211 30.4		228 19.4		13.6	155 13.0		35.8	99 00.7		20.2	343 16.9		19.9	356 56.0	130	17 57.0	-83
2	226 32.8		243 19.0		12.6	170 13.7		36.2	114 02.9		20.1	358 19.5		19.8	11 28.0	129	18 05.3	-81
3	241 35.3		258 18.6		11.6	185 14.4		36.6	129 05.2		20.1	13 22.1		19.8	25 59.9	130	18 13.4	-81
4	256 37.8		273 18.3		10.5	200 15.1		37.0	144 07.5		20.1	28 24.7		19.7	40 31.9	129	18 21.5	-80
5	271 40.2		288 17.9		9.5	215 15.8		37.4	159 09.8		20.0	43 27.3		19.7	55 03.8	128	18 29.5	-79
6	286 42.7		303 17.6	- 8	08.5	230 16.5	+20	37.8	174 12.0	+22	20.0	58 30.0	-15	19.7	69 35.6	129	-18 37.4	-79
7	301 45.2		318 17.2		07.4	245 17.2		38.1	189 14.3		20.0	73 32.6		19.6	84 07.5	127	18 45.3	-77
8	316 47.6		333 16.9		06.4	260 17.9		38.5	204 16.6		20.0	88 35.2		19.6	98 39.2	128	18 53.0	-76
9	331 50.1		348 16.5		05.3	275 18.6		38.9	219 18.8		19.9	103 37.8		19.5	113 11.0	127	19 00.6	-76
10	346 52.6		3 16.1		04.3	290 19.3		39.3	234 21.1		19.9	118 40.4		19.5	127 42.7	127	19 08.2	-75
11	1 55.0		18 15.8		03.3	305 20.0		39.7	249 23.4		19.9	133 43.0		19.4	142 14.4	127	19 15.7	-74
12	16 57.5		33 15.4	- 8	02.2	320 20.7	+20	40.1	264 25.7	+22	19.9	148 45.6	-15	19.4	156 46.1	126	-19 23.1	-73
13	31 59.9		48 15.1		01.2	335 21.4		40.5	279 27.9		19.8	163 48.2		19.4	171 17.7	126	19 30.4	-72
14	47 02.4		63 14.7		00.2	350 22.1		40.9	294 30.2		19.8	178 50.8		19.3	185 49.3	126	19 37.6	-71
15	62 04.9		78 14.4		7 59.1	5 22.8		41.3	309 32.5		19.8	193 53.4		19.3	200 20.9	125	19 44.7	-70
16	77 07.3		93 14.0		58.1	20 23.5		41.7	324 34.7		19.7	208 56.0		19.2	214 52.4	125	19 51.7	-69
17	92 09.8		108 13.6		57.1	35 24.2		42.0	339 37.0		19.7	223 58.6		19.2	229 23.9	124	19 58.6	-69
18	107 12.3		123 13.3	- 7	56.0	50 24.9	+20	42.4	354 39.3	+22	19.7	239 01.3	-15	19.1	243 55.3	125	-20 05.5	-67
19	122 14.7		138 12.9		55.0	65 25.6		42.8	9 41.5		19.7	254 03.9		19.1	258 26.8	124	20 12.2	-67
20	137 17.2		153 12.6		53.9	80 26.												

G M T	VENUS -3.4		MARS 1.7		JUPITER -1.8		SATURN 0.4		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
10	h	0	197 27.1	213 11.1 - 7 49.8	140 29.1 +20 44.8	84 52.9 +22 19.5	329 16.9 -15 18.9	331 03.4 123 -20 44.5 - 62				
1	1	212 29.5	228 10.8 48.7	155 29.8 45.1	99 55.1 19.5	344 19.5 18.8	345 34.7 122 20 50.7 - 60					
2	2	227 32.0	243 10.4 47.7	170 30.5 45.5	114 57.4 19.5	359 22.1 18.8	0 05.9 122 20 56.7 - 60					
3	3	242 34.4	258 10.1 46.6	185 31.2 45.9	129 59.7 19.4	14 24.7 18.7	14 37.1 121 21 02.7 - 59					
4	4	257 36.9	273 09.7 45.6	200 31.9 46.3	145 01.9 19.4	29 27.4 18.7	29 08.2 121 21 08.6 - 58					
5	5	272 39.4	288 09.4 44.6	215 32.6 46.7	160 04.2 19.4	44 30.0 18.7	43 39.3 121 21 14.4 - 57					
6	6	287 41.8	303 09.0 - 7 43.5	230 33.3 +20 47.1	175 06.5 +22 19.4	59 32.6 -15 18.6	58 10.4 120 -21 20.1 - 55					
7	7	302 44.3	318 08.7 42.5	245 34.0 47.4	190 08.7 19.3	74 35.2 18.6	72 41.4 121 21 25.6 - 55					
8	8	317 46.8	333 08.3 41.4	260 34.7 47.8	205 11.0 19.3	89 37.8 18.5	87 12.5 120 21 31.1 - 54					
9	9	332 49.2	348 08.0 40.4	275 35.4 48.2	220 13.3 19.3	104 40.4 18.5	101 43.5 119 21 36.5 - 53					
10	10	347 51.7	3 07.6 39.3	290 36.1 48.6	235 15.5 19.3	119 43.0 18.4	116 14.4 120 21 41.8 - 52					
11	11	2 54.2	18 07.3 38.3	305 36.8 49.0	250 17.8 19.2	134 45.6 18.4	130 45.4 119 21 47.0 - 50					
12	12	17 56.6	33 06.9 - 7 37.2	320 37.5 +20 49.4	265 20.1 +22 19.2	149 48.2 -15 18.4	145 16.3 119 -21 52.0 - 50					
13	13	32 59.1	48 06.6 36.2	335 38.2 49.8	280 22.3 19.2	164 50.9 18.3	159 47.2 118 21 57.0 - 49					
14	14	48 01.5	63 06.2 35.1	350 38.9 50.1	295 24.6 19.1	179 53.5 18.3	174 18.0 118 22 01.9 - 48					
15	15	63 04.0	78 05.8 34.1	5 39.6 50.5	310 26.8 19.1	194 56.1 18.2	188 48.8 118 22 06.7 - 46					
16	16	78 06.5	93 05.5 33.0	20 40.3 50.9	325 29.1 19.1	209 58.7 18.2	203 19.6 118 22 11.3 - 46					
17	17	93 08.9	108 05.1 32.0	35 41.0 51.3	340 31.4 19.1	225 01.3 18.1	217 50.4 117 22 15.9 - 44					
18	18	108 11.4	123 04.8 - 7 30.9	50 41.7 +20 51.7	355 33.6 +22 19.0	240 03.9 -15 18.1	232 21.1 118 -22 20.3 - 44					
19	19	123 13.9	138 04.4 29.9	65 42.4 52.0	10 35.9 19.0	255 06.5 18.0	246 51.9 117 22 24.7 - 43					
20	20	138 16.3	153 04.1 28.8	80 43.1 52.4	25 38.1 19.0	270 09.1 18.0	261 22.6 116 22 29.0 - 41					
21	21	153 18.8	168 03.7 27.8	95 43.8 52.8	40 40.4 18.9	285 11.7 18.0	275 53.2 117 22 33.1 - 40					
22	22	168 21.3	183 03.4 26.7	110 44.5 53.2	55 42.7 18.9	300 14.4 17.9	290 23.9 116 22 37.1 - 40					
23	23	183 23.7	198 03.0 25.7	125 45.2 53.6	70 44.9 18.9	315 17.0 17.9	304 54.5 116 22 41.1 - 38					
11	0	198 26.2	213 02.7 - 7 24.6	140 45.9 +20 53.9	85 47.2 +22 18.9	330 19.6 -15 17.8	319 25.1 116 -22 44.9 - 37					
1	1	213 28.7	228 02.3 23.6	155 46.6 54.3	100 49.4 18.8	345 22.2 17.8	333 55.7 115 22 48.6 - 36					
2	2	228 31.1	243 02.0 22.5	170 47.3 54.7	115 51.7 18.8	0 24.8 17.7	348 26.2 115 22 52.2 - 35					
3	3	243 33.6	258 01.6 21.5	185 48.0 55.1	130 54.0 18.8	15 27.4 17.7	2 56.7 116 22 55.7 - 34					
4	4	258 36.0	273 01.3 20.4	200 48.7 55.4	145 56.2 18.7	30 30.0 17.6	17 27.3 114 22 59.1 - 33					
5	5	273 38.5	288 00.9 19.4	215 49.4 55.8	160 58.5 18.7	45 32.7 17.6	31 57.7 115 23 02.4 - 32					
6	6	288 41.0	303 00.6 - 7 18.3	230 50.1 +20 56.2	176 00.7 +22 18.7	60 35.3 -15 17.6	46 28.2 115 -23 05.6 - 31					
7	7	303 43.4	318 00.2 17.3	245 50.8 56.6	191 03.0 18.7	75 37.9 17.5	60 58.7 114 23 08.7 - 30					
8	8	318 45.9	332 59.9 16.2	260 51.5 57.0	206 05.2 18.6	90 40.5 17.5	75 29.1 114 23 11.7 - 28					
9	9	333 48.4	347 59.5 15.2	275 52.2 57.3	221 07.5 18.6	105 43.1 17.4	89 59.5 114 23 14.5 - 28					
10	10	348 50.8	2 59.2 14.1	290 52.9 57.7	236 09.8 18.6	120 45.7 17.4	104 29.9 114 23 17.3 - 26					
11	11	3 53.3	17 58.8 13.1	305 53.6 58.1	251 12.0 18.5	135 48.3 17.3	119 00.3 113 23 19.9 - 26					
12	12	18 55.8	32 58.5 - 7 12.0	320 54.3 +20 58.5	266 14.3 +22 18.5	150 51.0 -15 17.3	133 30.6 113 -23 22.5 - 24					
13	13	33 58.2	47 58.2 10.9	335 55.0 58.8	281 16.5 18.5	165 53.6 17.2	148 00.9 114 23 24.9 - 23					
14	14	49 00.7	62 57.8 9.9	350 55.7 59.2	296 18.8 18.4	180 56.2 17.2	162 31.3 113 23 27.2 - 22					
15	15	64 03.2	77 57.5 8.8	5 56.4 59.6	311 21.0 18.4	195 58.8 17.2	177 01.6 113 23 29.4 - 21					
16	16	79 05.6	92 57.1 7.8	20 57.1 21 00.0	326 23.3 18.4	211 01.4 17.1	191 31.9 112 23 31.5 - 20					
17	17	94 08.1	107 56.8 6.7	35 57.8 00.3	341 25.5 18.4	226 04.0 17.1	206 02.1 113 23 33.5 - 18					
18	18	109 10.5	122 56.4 - 7 05.7	50 58.5 +21 00.7	356 27.8 +22 18.3	241 06.6 -15 17.0	220 32.4 113 -23 35.3 - 18					
19	19	124 13.0	137 56.1 04.6	65 59.2 01.1	11 30.1 18.3	256 09.3 17.0	235 02.7 112 23 37.1 - 16					
20	20	139 15.5	152 55.7 03.5	80 59.9 01.5	26 32.3 18.3	271 11.9 16.9	249 32.9 112 23 38.7 - 16					
21	21	154 17.9	167 55.4 02.5	96 00.6 01.8	41 34.6 18.2	286 14.5 16.9	264 03.1 112 23 40.3 - 14					
22	22	169 20.4	182 55.0 01.4	111 01.3 02.2	56 36.8 18.2	301 17.1 16.8	278 33.3 112 23 41.7 - 13					
23	23	184 22.9	197 54.7 00.4	126 02.0 02.6	71 39.1 18.2	316 19.7 16.8	293 03.5 112 23 43.0 - 12					
12	0	199 25.3	212 54.3 - 6 59.3	141 02.7 +21 02.9	86 41.3 +22 18.1	331 22.3 -15 16.8	307 33.7 112 -23 44.2 - 11					
1	1	214 27.8	227 54.0 58.2	156 03.4 03.3	101 43.6 18.1	346 24.9 16.7	322 03.9 112 23 45.3 - 10					
2	2	229 30.3	242 53.6 57.2	171 04.1 03.7	116 45.8 18.1	1 27.6 16.7	336 34.1 112 23 46.3 - 8					
3	3	244 32.7	257 53.3 56.1	186 04.7 04.0	131 48.1 18.1	16 30.2 16.6	351 04.3 111 23 47.1 - 8					
4	4	259 35.2	272 53.0 55.0	201 05.4 04.4	146 50.3 18.0	31 32.8 16.6	5 34.4 112 23 47.9 - 6					
5	5	274 37.7	287 52.6 54.0	216 06.1 04.8	161 52.6 18.0	46 35.4 16.5	20 04.6 111 23 48.5 - 5					
6	6	289 40.1	302 52.3 - 6 52.9	231 06.8 +21 05.2	176 54.8 +22 18.0	61 38.0 -15 16.5	34 34.7 111 -23 49.0 - 5					
7	7	304 42.6	317 51.9 51.9	246 07.5 05.5	191 57.1 17.9	76 40.6 16.4	49 04.8 112 23 49.5 - 3					
8	8	319 45.0	332 51.6 50.8	261 08.2 05.9	206 59.3 17.9	91 43.3 16.4	63 35.0 111 23 49.8 - 2					
9	9	334 47.5	347 51.2 49.7	276 08.9 06.3	222 01.6 17.9	106 45.9 16.4	78 05.1 111 23 50.0 0					
10	10	349 50.0	2 50.9 48.7	291 09.6 06.6	237 03.8 17.8	121 48.5 16.3	92 35.2 111 23 50.0 0					
11	11	4 52.4	17 50.5 47.6	306 10.3 07.0	252 06.1 17.8	136 51.1 16.3	107 05.3 112 23 50.0+ 2					
12	12	19 54.9	32 50.2 - 6 46.5	321 11.0 +21 07.4	267 08.3 +22 17.8	151 53.7 -15 16.2	121 35.5 111 -23 49.8+ 2					
13	13	34 57.4	47 49.9 45.5	336 11.7 07.7	282 10.6 17.8	166 56.3 16.2	136 05.6 111 23 49.6+ 4					
14	14	49 59.8	62 49.5 44.4	351 12.4 08.1	297 12.8 17.7	181 59.0 16.1	150 35.7 111 23 49.2+ 5					
15	15	65 02.3	77 49.2 43.3	6 13.1 08.5	312 15.1 17.7	197 01.6 16.1	165 05.8 111 23 48.7+ 6					
16	16	80 04.8	92 48.8 42.3	21 13.8 08.8	327 17.3 17.7	212 04.2 16.0	179 35.9 111 23 48.1+ 7					
17	17	95 07.2	107 48.5 41.2	36 14.5 09.2	342 19.6 17.6	227 06.8 16.0	194 06.0 111 23 47.4+ 8					
18	18	110 09.7	122 48.2 - 6 40.1	51 15.2 +21 09.6	357 21.8 +22 17.6	242 09.4 -15 16.0	208 36.1 112 -23 46.6+ 10					
19	19	125 12.1	137 47.8 39.1	66 15.9 09.9	12 24.0 17.6	257 12.0 15.9	223 06.3 111 23 45.6+ 10					
20	20	140 14.6	152 47.5 38.0	81 16.6 10.3	27 26.3 17.5	272 14.7 15.9	237 36.4 111 23 44.6+ 12					
21	21	155 17.1	167 47.1 36.9	96 17.3 10.7	42 28.5 17.5	287 17.3 15.8	252 06.5 111 23 43.4+ 12					
22	22	170 19.5	182 46.8 35.9	111 18.0 11.0	57 30.8 17.5	302 19.9 15.8	266 36.6 111 23 42.2+ 14					
23	23	185 22.0	197 46.4 34.8	126 18.7 11.4	72 33.0 17.4	317 22.5 15.7	281 06.7 112 23 40.8+ 15					
24	24	200 24.5	212 46.1 - 6 33.7	141 19.4 +21 11.8	87 35.3 +22 17.4	332 25.1 -15 15.7	295 36.9 111 -23 39.3+ 16					
code		-	- 3 + 11	+ 7 + 3	+ 22 0	+ 26 + 1						

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS			
	GHA	Dec.	No.	Name	SHA	Dec.				10	11	12	13	Sun's Low'r Limb Add	Venus Add	Mars Add	
										h m	h m	h m	h m				
10	0	179 35.4 + 7	34.6	7	Acamar	315 51.7 -40	29.1	72	4 06	///	■	■	■	Alt.			
	1	194 35.6	35.6	5	Achernar	335 59.6 -57	27.8	70	4 19	///	■	■	■	0			
	2	209 35.7	36.5	30	Acrux	173 57.6 -62	51.3	68	4 30	///	0 41	■	■	30	0.3	0.1	
	3	224 35.9 ..	37.4	19	Adhara	255 46.9 -28	54.9	66	4 38	///	25 33	1 33	3 10	45	0.3	0.1	
	4	239 36.1	38.4	10	Aldebaran	291 39.7 +16	25.3	64	4 46	///	24 44	0 44	1 54	60	0.3	0.1	
	5	254 36.2	39.3					62	4 52	1 31	24 12	0 12	1 18	75	0.3	0.0	
	6	269 36.4 + 7	40.2	32	Alioth	166 58.2 +56	12.0	60	4 58	2 04	23 49	24 51	0 51	90	0.3	0.0	
	7	284 36.6	41.1	34	Alkaid	153 32.6 +49	32.0	58	5 02	2 26	23 31	24 31	0 31				
	8	299 36.8	42.1	55	Al Na'ir	28 38.6 -47	10.5	56	5 07	2 43	23 15	24 14	0 14				
	9	314 36.9 ..	43.0	15	Alnilam	276 30.8 -1	13.8	54	5 11	2 58	23 02	24 00	0 00				
	10	329 37.1	43.9	25	Alphard	218 38.8 -8	28.1	52	5 14	3 09	22 50	23 47	24 36				
	11	344 37.3	44.8					50	5 17	3 20	22 40	23 36	24 25				
	12	359 37.4 + 7	45.8	41	Alphecca	126 47.6 +26	51.6	45	5 24	3 41	22 18	23 13	24 02	Moon's Lower Limb			
	13	14 37.6	46.7	1	Alpheratz	358 29.0 +28	50.6	40	5 30	3 56	22 01	22 55	23 44	Add			
	14	29 37.8	47.6	51	Altair	62 50.8 +8	44.8	35	5 34	4 08	21 46	22 39	23 29	Alt.	10	11	
	15	44 38.0 ..	48.6	2	Ankaa	353 59.0 -42	32.8	30	5 39	4 18	21 34	22 26	23 15	0			
	16	59 38.1	49.5	42	Antares	113 19.5 -26	20.1	20	5 46	4 32	21 12	22 03	22 53	4	12.0	11.9	
	17	74 38.3	50.4					10	5 52	4 42	20 53	21 43	22 33	8	12.0	11.9	
	18	89 38.5 + 7	51.3	37	Arcturus	146 35.1 +19	24.6	0	5 58	4 49	20 36	21 25	22 14	12	12.0	11.9	
	19	104 38.6	52.3	43	Atria	109 00.2 -68	56.8	10	6 04	4 54	20 19	21 07	21 56	16	12.1	11.9	
	20	119 38.8	53.2	22	Avior	234 35.8 -59	22.3	20	6 10	4 56	20 00	20 47	21 36	20	12.1	12.0	
	21	134 39.0 ..	54.1	13	Bellatrix	279 19.0 +6	18.6	30	6 16	4 56	19 39	20 25	21 14	24	12.1	12.1	
	22	149 39.2	55.0	16	Betel'ge	271 48.6 +7	24.0	35	6 20	4 55	19 27	20 11	21 00	28	12.2	12.2	
	23	164 39.3	56.0					40	6 24	4 53	19 13	19 56	20 45	32	12.3	12.3	
				17	Canopus	264 15.7 -52	40.5	45	6 29	4 51	18 56	19 38	20 27	36	12.4	12.4	
				12	Capella	281 39.2 +45	57.4	50	6 35	4 46	18 35	19 15	20 04	40	12.5	12.5	
				53	Deneb	50 01.4 +45	06.9	52	6 38	4 44	18 25	19 05	19 53	44	12.6	12.6	
				28	Denebola	183 17.8 +14	49.1	54	6 41	4 41	18 14	18 52	19 41	48	12.7	12.7	
				4	Diphda	349 39.9 -18	13.9	56	6 44	4 38	18 01	18 39	19 27	52	12.8	12.8	
								58	6 47	4 34	17 47	18 22	19 10	56	13.0	13.0	
				27	Dubhe	194 44.4 +61	59.6	60	6 51	4 30	17 30	18 03	18 50	60	13.1	13.1	
				14	Elnath	279 07.9 +28	34.3	S						64	13.3	13.3	
				47	Eltanin	91 06.2 +51	29.3	Lat.	Sunset	Twlt. ends	Moonset				68	13.5	13.5
				54	Enif	34 30.1 +9	40.1	N.			10	11	12	13	72	13.6	13.6
				56	Fomalhaut	16 12.2 -29	51.5				h m	h m	h m	h m	76	13.8	13.8
											h m	h m	h m	h m	80	14.0	14.0
				31	Gacrux	172 49.1 -56	52.0	72	20 00	///	■	■	■	84	14.2	14.2	
				29	Glenah	176 36.9 -17	17.9	70	19 46	///	■	■	■	88	14.4	14.4	
				35	Hadar	149 49.3 -60	09.6	68	19 35	///	3 09	■	■	90	14.6	14.6	
				6	Hamal	328 50.4 +23	15.1	66	19 26	///	4 00	3 58	4 01				
				48	Kaus Aust.	84 41.5 -34	24.4	64	19 19	///	4 32	4 47	5 19				
								62	19 12	22 42	4 56	5 19	5 55				
				40	Kochab	137 16.7 +74	20.1	60	19 07	22 07	5 15	5 42	6 22	Add to table, back cover			
				57	Markab	14 22.1 +14	57.8	58	19 02	21 43	5 31	6 01	6 42	Moon's Upper Limb			
				8	Menkar	315 01.0 +3	54.9	56	18 57	21 24	5 45	6 17	6 59	Subtract			
				36	Menkent	148 58.7 -36	09.2	54	18 53	21 09	5 56	6 30	7 14	Alt.	10	11	
				24	Miapl'dus	221 48.8 -69	32.3	52	18 50	20 57	6 07	6 42	7 26	0			
								50	18 46	20 46	6 16	6 53	7 37	4	17.6	17.7	
				9	Mirfak	309 43.3 +49	42.3	45	18 39	20 25	6 36	7 15	8 00	8	17.6	17.6	
				50	Nunki	76 52.2 -26	21.2	40	18 34	20 10	6 52	7 32	8 19	12	17.5	17.5	
				52	Peacock	54 27.9 -56	52.6	35	18 29	19 57	7 05	7 47	8 34	16	17.5	17.5	
				21	Pollux	244 21.0 +28	08.2	30	18 24	19 46	7 17	8 00	8 48	20	17.5	17.5	
				20	Procyon	245 45.3 +5	20.3	20	18 17	19 32	7 37	8 22	9 11	24	17.5	17.5	
								10	18 10	19 21	7 55	8 42	9 30	28	17.4	17.4	
				46	R'alhague	96 46.8 +12	35.3	0	18 05	19 14	8 11	9 00	9 49	32	17.4	17.4	
				26	Regulus	208 29.7 +12	11.0	10	17 59	19 09	8 28	9 18	10 07	36	17.3	17.3	
				11	Rigel	281 54.1 -8	15.2	20	17 53	19 06	8 45	9 37	10 27	40	17.2	17.2	
				38	Rigel Kent.	140 50.9 -60	39.3	30	17 46	19 06	9 06	9 59	10 50	44	17.1	17.1	
				44	Sabik	103 02.4 -15	40.4	35	17 42	19 06	9 18	10 12	11 03	48	17.0	17.0	
								40	17 38	19 08	9 31	10 27	11 19	52	16.9	16.9	
				3	Schedar	350 31.0 +56	17.5	45	17 33	19 10	9 48	10 45	11 37	56	16.9	16.9	
				45	Shaula	97 20.9 -37	04.3	50	17 27	19 14	10 08	11 07	12 00	60	16.7	16.7	
				18	Sirius	259 12.2 -16	39.4	52	17 24	19 16	10 17	11 18	12 11	64	16.6	16.6	
				33	Spica	159 16.9 -10	55.9	54	17 21	19 19	10 28	11 30	12 23	68	16.4	16.4	
				23	Suhail	223 24.4 -43	15.4	56	17 18	19 22	10 40	11 44	12 38	72	16.3	16.3	
								58	17 14	19 25	10 55	12 00	12 54	76	16.1	16.1	
				49	Vega	81 08.4 +38	44.2	60	17 10	19 29	11 12	12 19	13 14	80	15.9	15.9	
				39	Zub'g'bi	137 53.4 -15	51.6	S						84	15.7	15.7	
														88	15.6	15.6	
														90	15.4	15.4	
															15.2	15.2	
															15.0	15.0	
															14.8	14.8	

G M T	VENUS -3.4		MARS 1.7		JUPITER -1.7		SATURN 0.4		MOON		
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.
13 0	200 24.5	212 46.1 - 6 33.7	141 19.4 +21 11.8	87 35.3 +22 17.4	332 25.1 -15 15.7	295 36.9 111 -23 39.3 + 16					
1 1	215 26.9	227 45.8 32.7	156 20.0 12.1	102 37.5 17.4	347 27.7 15.6	310 07.0 111 23 37.7 + 18					
2 2	230 29.4	242 45.4 31.6	171 20.7 12.5	117 39.8 17.4	2 30.4 15.6	324 37.1 112 23 35.9 + 18					
3 3	245 31.9	257 45.1 .. 30.5	186 21.4 .. 12.8	132 42.0 .. 17.3	17 33.0 .. 15.5	339 07.3 111 +23 34.1 + 20					
4 4	260 34.3	272 44.7 29.4	201 22.1 13.2	147 44.3 17.3	32 35.6 15.5	353 37.4 112 23 32.1 + 20					
5 5	275 36.8	287 44.4 28.4	216 22.8 13.6	162 46.5 17.3	47 38.2 15.5	8 07.6 111 23 30.1 + 22					
6 6	290 39.3	302 44.1 - 6 27.3	231 23.5 +21 13.9	177 48.7 +22 17.2	62 40.8 -15 15.4	22 37.7 112 -23 27.9 + 23					
7 7	305 41.7	317 43.7 26.2	246 24.2 14.3	192 51.0 17.2	77 43.5 15.4	37 07.9 112 23 25.6 + 24					
8 8	320 44.2	332 43.4 25.2	261 24.9 14.7	207 53.2 17.2	92 46.1 15.3	51 38.1 112 23 23.2 + 25					
9 9	335 46.6	347 43.0 .. 24.1	276 25.6 .. 15.0	222 55.5 .. 17.1	107 48.7 .. 15.3	66 08.3 112 +23 20.7 + 26					
10 10	350 49.1	2 42.7 23.0	291 26.3 15.4	237 57.7 17.1	122 51.3 15.2	80 38.5 112 23 18.1 + 27					
11 11	5 51.6	17 42.4 21.9	306 27.0 15.7	252 59.9 17.1	137 53.9 15.2	95 08.7 112 23 15.4 + 29					
12 12	20 54.0	32 42.0 - 6 20.9	321 27.7 +21 16.1	268 02.2 +22 17.0	152 56.5 -15 15.1	109 38.9 113 -23 12.5 + 29					
13 13	35 56.5	47 41.7 19.8	336 28.4 16.5	283 04.4 17.0	167 59.2 15.1	124 09.2 112 23 09.6 + 31					
14 14	50 59.0	62 41.3 18.7	351 29.1 16.8	298 06.7 17.0	183 01.8 15.0	138 39.4 113 23 06.5 + 32					
15 15	66 01.4	77 41.0 .. 17.6	6 29.8 .. 17.2	313 08.9 .. 16.9	198 04.4 .. 15.0	153 09.7 112 +23 03.3 + 32					
16 16	81 03.9	92 40.7 16.6	21 30.5 17.5	328 11.2 16.9	213 07.0 15.0	167 39.9 113 23 00.1 + 34					
17 17	96 06.4	107 40.3 15.5	36 31.1 17.9	343 13.4 16.9	228 09.6 14.9	182 10.2 113 22 56.7 + 35					
18 18	111 08.8	122 40.0 - 6 14.4	51 31.8 +21 18.3	358 15.6 +22 16.8	243 12.3 -15 14.9	196 40.5 113 -22 53.2 + 37					
19 19	126 11.3	137 39.7 13.3	66 32.5 18.6	13 17.9 16.8	258 14.9 14.8	211 10.8 113 22 49.5 + 37					
20 20	141 13.8	152 39.3 12.3	81 33.2 19.0	28 20.1 16.8	273 17.5 14.8	225 41.1 114 22 45.8 + 38					
21 21	156 16.2	167 39.0 .. 11.2	96 33.9 .. 19.3	43 22.3 .. 16.8	288 20.1 .. 14.7	240 11.5 113 +22 42.0 + 39					
22 22	171 18.7	182 38.6 10.1	111 34.6 19.7	58 24.6 16.7	303 22.7 14.7	254 41.8 114 22 38.1 + 41					
23 23	186 21.1	197 38.3 09.0	126 35.3 20.0	73 26.8 16.7	318 25.4 14.6	269 12.2 114 22 34.0 + 41					
14 0	201 23.6	212 38.0 - 6 08.0	141 36.0 +21 20.4	88 29.1 +22 16.7	333 28.0 -15 14.6	283 42.6 114 -22 29.9 + 43					
1 1	216 26.1	227 37.6 06.9	156 36.7 20.7	103 31.3 16.6	348 30.6 14.5	298 13.0 114 22 25.6 + 44					
2 2	231 28.5	242 37.3 05.8	171 37.4 21.1	118 33.5 16.6	3 33.2 14.5	312 43.4 114 22 21.2 + 45					
3 3	246 31.0	257 37.0 .. 04.7	186 38.1 .. 21.5	133 35.8 .. 16.6	18 35.8 .. 14.5	327 13.8 114 +22 16.7 + 46					
4 4	261 33.5	272 36.6 03.6	201 38.8 21.8	148 38.0 16.5	33 38.5 14.4	341 44.2 115 22 12.1 + 46					
5 5	276 35.9	287 36.3 02.6	216 39.5 22.2	163 40.2 16.5	48 41.1 14.4	356 14.7 115 22 07.5 + 49					
6 6	291 38.4	302 35.9 - 6 01.5	231 40.1 +21 22.5	178 42.5 +22 16.5	63 43.7 -15 14.3	10 45.2 115 -22 02.6 + 49					
7 7	306 40.9	317 35.6 6 00.4	246 40.8 22.9	193 44.7 16.4	78 46.3 14.3	25 15.7 115 21 57.7 + 50					
8 8	321 43.3	332 35.3 5 59.3	261 41.5 23.2	208 47.0 16.4	93 48.9 14.2	39 46.2 115 21 52.7 + 51					
9 9	336 45.8	347 34.9 .. 58.2	276 42.2 .. 23.6	223 49.2 .. 16.4	108 51.6 .. 14.2	54 16.7 116 +21 47.6 + 52					
10 10	351 48.2	2 34.6 57.2	291 42.9 23.9	238 51.4 16.3	123 54.2 14.1	68 47.3 116 21 42.4 + 53					
11 11	6 50.7	17 34.3 56.1	306 43.6 24.3	253 53.7 16.3	138 56.8 14.1	83 17.9 116 21 37.1 + 55					
12 12	21 53.2	32 33.9 - 5 55.0	321 44.3 +21 24.6	268 55.9 +22 16.3	153 59.4 -15 14.0	97 48.5 116 -21 31.6 + 55					
13 13	36 55.6	47 33.6 53.9	336 45.0 25.0	283 58.1 16.2	169 02.1 14.0	112 19.1 116 21 26.1 + 57					
14 14	51 58.1	62 33.3 52.8	351 45.7 25.3	299 00.4 16.2	184 04.7 13.9	126 49.7 117 21 20.4 + 57					
15 15	67 00.6	77 32.9 .. 51.7	6 46.4 .. 25.7	314 02.6 .. 16.2	199 07.3 .. 13.9	141 20.4 116 +21 14.7 + 59					
16 16	82 03.0	92 32.6 50.7	21 47.1 26.0	329 04.8 16.1	214 09.9 13.9	155 51.0 117 21 08.8 + 59					
17 17	97 05.5	107 32.3 49.6	36 47.8 26.4	344 07.1 16.1	229 12.5 13.8	170 21.7 117 21 02.9 + 61					
18 18	112 08.0	122 31.9 - 5 48.5	51 48.4 +21 26.7	359 09.3 +22 16.1	244 15.2 -15 13.8	184 52.4 118 -20 56.8 + 61					
19 19	127 10.4	137 31.6 47.4	66 49.1 27.1	14 11.5 16.0	259 17.8 13.7	199 23.2 117 20 50.7 + 63					
20 20	142 12.9	152 31.3 46.3	81 49.8 27.4	29 13.8 16.0	274 20.4 13.7	213 53.9 118 20 44.4 + 64					
21 21	157 15.4	167 30.9 .. 45.2	96 50.5 .. 27.8	44 16.0 .. 16.0	289 23.0 .. 13.6	228 24.7 118 +20 38.0 + 64					
22 22	172 17.8	182 30.6 44.2	111 51.2 28.1	59 18.2 15.9	304 25.7 13.6	242 55.5 118 20 31.6 + 66					
23 23	187 20.3	197 30.3 43.1	126 51.9 28.5	74 20.4 15.9	319 28.3 13.5	257 26.3 118 20 25.0 + 67					
15 0	202 22.7	212 29.9 - 5 42.0	141 52.6 +21 28.8	89 22.7 +22 15.9	334 30.9 -15 13.5	271 57.1 119 -20 18.3 + 67					
1 1	217 25.2	227 29.6 40.9	156 53.3 29.2	104 24.9 15.8	349 33.5 13.4	286 28.0 118 20 11.6 + 69					
2 2	232 27.7	242 29.3 39.8	171 54.0 29.5	119 27.1 15.8	4 36.1 13.4	300 58.8 119 20 04.7 + 69					
3 3	247 30.1	257 28.9 .. 38.7	186 54.7 .. 29.9	134 29.4 .. 15.8	19 38.8 .. 13.3	315 29.7 119 +19 57.8 + 71					
4 4	262 32.6	272 28.6 37.6	201 55.3 30.2	149 31.6 15.7	34 41.4 13.3	330 00.6 120 19 50.7 + 72					
5 5	277 35.1	287 28.3 36.6	216 56.0 30.6	164 33.8 15.7	49 44.0 13.3	344 31.6 119 19 43.5 + 72					
6 6	292 37.5	302 27.9 - 5 35.5	231 56.7 +21 30.9	179 36.1 +22 15.7	64 46.6 -15 13.2	359 02.5 120 -19 36.3 + 74					
7 7	307 40.0	317 27.6 34.4	246 57.4 31.3	194 38.3 15.6	79 49.3 13.2	13 33.5 120 19 28.9 + 74					
8 8	322 42.5	332 27.3 33.3	261 58.1 31.6	209 40.5 15.6	94 51.9 13.1	28 04.5 120 19 21.5 + 76					
9 9	337 44.9	347 26.9 .. 32.2	276 58.8 .. 32.0	224 42.7 .. 15.6	109 54.5 .. 13.1	42 35.5 121 +19 13.9 + 76					
10 10	352 47.4	2 26.6 31.1	291 59.5 32.3	239 45.0 15.5	124 57.1 13.0	57 06.6 120 19 06.3 + 78					
11 11	7 49.9	17 26.3 30.0	307 00.2 32.7	254 47.2 15.5	139 59.8 13.0	71 37.6 121 18 58.5 + 78					
12 12	22 52.3	32 25.9 - 5 28.9	322 00.9 +21 33.0	269 49.4 +22 15.5	155 02.4 -15 12.9	86 08.7 121 -18 50.7 + 79					
13 13	37 54.8	47 25.6 27.8	337 01.6 33.3	284 51.7 15.4	170 05.0 12.9	100 39.8 121 18 42.8 + 81					
14 14	52 57.2	62 25.3 26.8	352 02.2 33.7	299 53.9 15.4	185 07.6 12.8	115 10.9 122 18 34.7 + 81					
15 15	67 59.7	77 24.9 .. 25.7	7 02.9 .. 34.0	314 56.1 .. 15.4	200 10.2 .. 12.8	129 42.1 121 +18 26.6 + 82					
16 16	83 02.2	92 24.6 24.6	22 03.6 34.4	329 58.3 15.3	215 12.9 12.7	144 13.2 122 18 18.4 + 83					
17 17	98 04.6	107 24.3 23.5	37 04.3 34.7	345 00.6 15.3	230 15.5 12.7	158 44.4 122 18 10.1 + 84					
18 18	113 07.1	122 24.0 - 5 22.4	52 05.0 +21 35.1	0 02.8 +22 15.3	245 18.1 -15 12.7	173 15.6 122 -18 01.7 + 85					
19 19	128 09.6	137 23.6 21.3	67 05.7 35.4	15 05.0 15.2	260 20.7 12.6	187 46.8 123 17 53.2 + 86					
20 20	143 12.0	152 23.3 20.2	82 06.4 35.7	30 07.2 15.2	275 23.4 12.6	202 18.1 122 17 44.6 + 87					
21 21	158 14.5	167 23.0 .. 19.1	97 07.1 .. 36.1	45 09.5 .. 15.2	290 26.0 .. 12.5	216 49.3 123 +17 35.9 + 87					
22 22	173 17.0	182 22.6 18.0	112 07.8 36.4	60 11.7 15.1	305 28.6 12.5	231 20.6 123 17 27.2 + 89					
23 23	188 19.4	197 22.3 16.9	127 08.4 36.8	75 13.9 15.1	320 31.2 12.4	245 51.9 123 17 18.3 + 89					
24 24	203 21.9	212 22.0 - 5 15.8	142 09.1 +21 37.1	90 16.1 +22 15.0	335 33.9 -15 12.4	260 23.2 123 -17 09.4 + 91					
code	-	- 3 + 11	+ 7 + 4	+ 22 - 1	+ 27 0						

G M T	T GHA	VENUS -3.4		MARS 1.8		JUPITER -1.7		SATURN 0.4		MOON			
		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
16	0	203 21.9	212 22.0 - 5	15.8	142 09.1 +21	37.1	90 16.1 +22	15.0	335 33.9 -15	12.4	260 23.2 123	-17	09.4 + 91
	1	218 24.4	227 21.6	14.7	157 09.8	37.5	105 18.4	15.0	350 36.5	12.3	274 54.5 123	17	00.3 + 91
	2	233 26.8	242 21.3	13.6	172 10.5	37.8	120 20.6	15.0	5 39.1	12.3	289 25.8 124	16	51.2 + 92
	3	248 29.3	257 21.0 ..	12.6	187 11.2 ..	38.1	135 22.8 ..	14.9	20 47.2 ..	12.2	303 57.2 124	-16	42.0 + 93
	4	263 31.7	272 20.7	11.5	202 11.9	38.5	150 25.0	14.9	35 44.4	12.2	318 28.6 124	16	32.7 + 94
	5	278 34.2	287 20.3	10.4	217 12.6	38.8	165 27.2	14.9	50 47.0	12.1	333 00.0 124	16	23.3 + 94
	6	293 36.7	302 20.0 - 5	09.3	232 13.3 +21	39.2	180 29.5 +22	14.8	65 49.6 -15	12.1	347 31.4 124	-16	13.9 + 96
	7	308 39.1	317 19.7	08.2	247 13.9	39.5	195 31.7	14.8	80 52.2	12.0	2 02.8 124	16	04.3 + 96
	8	323 41.6	332 19.3	07.1	262 14.6	39.8	210 33.9	14.8	95 54.9	12.0	16 34.2 125	15	54.7 + 98
	9	338 44.1	347 19.0 ..	06.0	277 15.3 ..	40.2	225 36.1 ..	14.7	110 57.5 ..	12.0	31 05.7 125	-15	44.9 + 98
	10	353 46.5	2 18.7	04.9	292 16.0	40.5	240 38.3	14.7	126 00.1	11.9	45 37.2 125	15	35.1 + 99
	11	8 49.0	17 18.4	03.8	307 16.7	40.8	255 40.6	14.7	141 02.7	11.9	60 08.7 125	15	25.2 + 99
	12	23 51.5	32 18.0 - 5	02.7	322 17.4 +21	41.2	270 42.8 +22	14.6	156 05.4 -15	11.8	74 40.2 125	-15	15.3 +101
	13	38 53.9	47 17.7	01.6	337 18.1	41.5	285 45.0	14.6	171 08.0	11.8	89 11.7 125	15	05.2 +101
	14	53 56.4	62 17.4 5	00.5	352 18.8	41.9	300 47.2	14.6	186 10.6	11.7	103 43.2 125	14	55.1 +102
	15	68 58.8	77 17.0 - 4	59.4	7 19.4 ..	42.2	315 49.4 ..	14.5	201 13.2 ..	11.7	118 14.7 126	-14	44.9 +103
	16	84 01.3	92 16.7	58.3	22 20.1	42.5	330 51.7	14.5	216 15.9	11.6	132 46.3 125	14	34.6 +104
	17	99 03.8	107 16.4	57.2	37 20.8	42.9	345 53.9	14.5	231 18.5	11.6	147 17.8 126	14	24.2 +105
	18	114 06.2	122 16.1 - 4	56.1	52 21.5 +21	43.2	0 56.1 +22	14.4	246 21.1 -15	11.5	161 49.4 126	-14	13.7 +105
	19	129 08.7	137 15.7	55.0	67 22.2	43.5	15 58.3	14.4	261 23.8	11.5	176 21.0 126	14	03.2 +106
	20	144 11.2	152 15.4	53.9	82 22.9	43.9	31 00.5	14.3	276 26.4	11.4	190 52.6 126	13	52.6 +107
	21	159 13.6	167 15.1 ..	52.8	97 23.6 ..	44.2	46 02.8 ..	14.3	291 29.0 ..	11.4	205 24.2 126	-13	41.9 +108
	22	174 16.1	182 14.8	51.7	112 24.3	44.5	61 05.0	14.3	306 31.6	11.3	219 55.8 126	13	31.1 +109
	23	189 18.6	197 14.4	50.6	127 24.9	44.9	76 07.2	14.2	321 34.3	11.3	234 27.4 126	13	20.2 +109
17	0	204 21.0	212 14.1 - 4	49.5	142 25.6 +21	45.2	91 09.4 +22	14.2	336 36.9 -15	11.2	248 59.0 127	-13	09.3 +110
	1	219 23.5	227 13.8	48.4	157 26.3	45.5	106 11.6	14.2	351 39.5	11.2	263 30.7 126	12	58.3 +110
	2	234 26.0	242 13.4	47.3	172 27.0	45.9	121 13.8	14.1	6 42.1	11.2	278 02.3 126	12	47.3 +112
	3	249 28.4	257 13.1 ..	46.2	187 27.7 ..	46.2	136 16.1 ..	14.1	21 44.8 ..	11.1	292 33.9 127	-12	36.1 +112
	4	264 30.9	272 12.8	45.1	202 28.4	46.5	151 18.3	14.1	36 47.4	11.1	307 05.6 127	12	24.9 +113
	5	279 33.3	287 12.5	44.0	217 29.1	46.9	166 20.5	14.0	51 50.0	11.0	321 37.3 126	12	13.6 +114
	6	294 35.8	302 12.1 - 4	42.9	232 29.7 +21	47.2	181 22.7 +22	14.0	66 52.7 -15	11.0	336 08.9 127	-12	02.2 +114
	7	309 38.3	317 11.8	41.8	247 30.4	47.5	196 24.9	14.0	81 55.3	10.9	350 40.6 126	11	50.8 +115
	8	324 40.7	332 11.5	40.7	262 31.1	47.8	211 27.1	13.9	96 57.9	10.9	5 12.2 127	11	39.3 +116
	9	339 43.2	347 11.2 ..	39.6	277 31.8 ..	48.2	226 29.3 ..	13.9	112 00.5 ..	10.8	19 43.9 127	-11	27.7 +116
	10	354 45.7	2 10.8	38.5	292 32.5	48.5	241 31.6	13.8	127 03.2	10.8	34 15.6 126	11	16.1 +117
	11	9 48.1	17 10.5	37.4	307 33.2	48.8	256 33.8	13.8	142 05.8	10.7	48 47.2 127	11	04.4 +118
	12	24 50.6	32 10.2 - 4	36.3	322 33.8 +21	49.2	271 36.0 +22	13.8	157 08.4 -15	10.7	63 18.9 127	-10	52.6 +118
	13	39 53.1	47 09.9	35.2	337 34.5	49.5	286 38.2	13.7	172 11.0	10.6	77 50.6 127	10	40.8 +120
	14	54 55.5	62 09.5	34.1	352 35.2	49.8	301 40.4	13.7	187 13.7	10.6	92 22.3 126	10	28.8 +119
	15	69 58.0	77 09.2 ..	33.0	7 35.9 ..	50.2	316 42.6 ..	13.7	202 16.3 ..	10.5	106 53.9 127	-10	16.9 +121
	16	85 00.4	92 08.9	31.9	22 36.6	50.5	331 44.8	13.6	217 18.9	10.5	121 25.6 127	10	04.8 +121
	17	100 02.9	107 08.6	30.8	37 37.3	50.8	346 47.0	13.6	232 21.6	10.4	135 57.3 126	9	52.7 +121
	18	115 05.4	122 08.2 - 4	29.7	52 38.0 +21	51.1	1 49.3 +22	13.6	247 24.2 -15	10.4	150 28.9 127	-9	40.6 +123
	19	130 07.8	137 07.9	28.6	67 38.6	51.5	16 51.5	13.5	262 26.8	10.3	165 00.6 126	9	28.3 +123
	20	145 10.3	152 07.6	27.5	82 39.3	51.8	31 53.7	13.5	277 29.4	10.3	179 32.2 127	9	16.0 +123
	21	160 12.8	167 07.3 ..	26.3	97 40.0 ..	52.1	46 55.9 ..	13.5	292 32.1 ..	10.3	194 03.9 126	-9	03.7 +124
	22	175 15.2	182 07.0	25.2	112 40.7	52.4	61 58.1	13.4	307 34.7	10.2	208 35.5 126	8	51.3 +125
	23	190 17.7	197 06.6	24.1	127 41.4	52.8	77 00.3	13.4	322 37.3	10.2	223 07.1 126	8	38.8 +125
18	0	205 20.2	212 06.3 - 4	23.0	142 42.1 +21	53.1	92 02.5 +22	13.3	337 40.0 -15	10.1	237 38.7 126	-8	26.3 +126
	1	220 22.6	227 06.0	21.9	157 42.8	53.4	107 04.7	13.3	352 42.6	10.1	252 10.3 126	8	13.7 +127
	2	235 25.1	242 05.7	20.8	172 43.4	53.7	122 06.9	13.3	7 45.2	10.0	266 41.9 126	8	01.0 +127
	3	250 27.6	257 05.3 ..	19.7	187 44.1 ..	54.1	137 09.1 ..	13.2	22 47.8 ..	10.0	281 13.5 126	-7	48.3 +127
	4	265 30.0	272 05.0	18.6	202 44.8	54.4	152 11.4	13.2	37 50.5	09.9	295 45.1 126	7	35.6 +128
	5	280 32.5	287 04.7	17.5	217 45.5	54.7	167 13.6	13.1	52 53.1	09.9	310 16.7 125	7	22.8 +129
	6	295 34.9	302 04.4 - 4	16.4	232 46.2 +21	55.0	182 15.8 +22	13.1	67 55.7 -15	09.8	324 48.2 125	-7	09.9 +129
	7	310 37.4	317 04.0	15.3	247 46.9	55.4	197 18.0	13.1	82 58.4	09.8	339 19.7 126	6	57.0 +129
	8	325 39.9	332 03.7	14.2	262 47.5	55.7	212 20.2	13.0	98 01.0	09.7	353 51.3 125	6	44.1 +131
	9	340 42.3	347 03.4 ..	13.1	277 48.2 ..	56.0	227 22.4 ..	13.0	113 03.6 ..	09.7	8 22.8 125	-6	31.0 +130
	10	355 44.8	2 03.1	11.9	292 48.9	56.3	242 24.6	13.0	128 06.3	09.6	22 54.3 124	6	18.0 +131
	11	10 47.3	17 02.8	10.8	307 49.6	56.6	257 26.8	12.9	143 08.9	09.6	37 25.7 125	6	04.9 +132
	12	25 49.7	32 02.4 - 4	09.7	322 50.3 +21	57.0	272 29.0 +22	12.9	158 11.5 -15	09.5	51 57.2 124	-5	51.7 +132
	13	40 52.2	47 02.1	08.6	337 51.0	57.3	287 31.2	12.8	173 14.1	09.5	66 28.6 124	5	38.5 +133
	14	55 54.7	62 01.8	07.5	352 51.6	57.6	302 33.4	12.8	188 16.8	09.4	81 00.0 124	5	25.2 +133
	15	70 57.1	77 01.5 ..	06.4	7 52.3 ..	57.9	317 35.6 ..	12.8	203 19.4 ..	09.4	95 31.4 124	-5	11.9 +133
	16	85 59.6	92 01.1	05.3	22 53.0	58.2	332 37.8	12.7	218 22.0	09.3	110 02.8 123	4	58.6 +134
	17	101 02.1	107 00.8	04.2	37 53.7	58.6	347 40.0	12.7	233 24.7	09.3	124 34.1 123	4	45.2 +134
	18	116 04.5	122 00.5 - 4	03.1	52 54.4 +21	58.9	2 42.2 +22	12.7	248 27.3 -15	09.3	139 05.4 123	-4	31.8 +135
	19	131 07.0	137 00.2	01.9	67 55.1	59.2	17 44.5	12.6	263 29.9	09.2	153 36.7 123	4	18.3 +135
	20	146 09.4	151 59.9	4 00.8	82 55.7	59.5	32 46.7	12.6	278 32.6	09.2	168 08.0 123	4	04.8 +135
	21	161 11.9	166 59.5	3 59.7	97 56.4	59.8	47 48.9	12.5	293 35.2	09.1	182 39.3 122	-3	51.3 +136
	22	176 14.4	181 59.2	58.6	112 57.1	60.2	62 51.1	12.5	308 37.8	09.1	197 10.5 122	3	37.7 +136
	23	191 16.8	196 58.9	57.5	127 57.8	60.5	77 53.3	12.5	323 40.5	09.0	211 41.7 121	3	24.1 +137
24	0	206 19.3	211 58.6 - 3	56.4	142 58.5 +22	60.8	92 55.5 +22	12.4	338 43.1 -15	09.0	226 12.8 121	-3	10.4 +137
code	-	- 3	+ 11		+ 7	+ 3	+ 22	- 1	+ 26	+ 1			

code

G M T	VENUS -3.4		MARS 1.8		JUPITER -1.7		SATURN 0.4		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
19	0	206 19.3	211 58.6 - 3 56.4	142 58.5 +22 00.8	92 55.5 +22 12.4	338 43.1 -15 09.0	226 12.8 121 - 3 10.4 +137					
	1	221 21.8	226 58.3 55.3	157 59.1 01.1	107 57.7 12.4	353 45.7 08.9	240 43.9 121 2 56.7 +137					
	2	236 24.2	241 57.9 54.2	172 59.8 01.4	122 59.9 12.4	8 48.3 08.9	255 15.0 121 2 43.0 +138					
	3	251 26.7	256 57.6 .. 53.0	188 00.5 .. 01.7	138 02.1 .. 12.3	23 51.0 .. 08.8	269 46.1 120 .. 2 29.2 +138					
	4	266 29.2	271 57.3 51.9	203 01.2 02.1	153 04.3 12.3	38 53.6 08.8	284 17.1 120 2 15.4 +138					
	5	281 31.6	286 57.0 50.8	218 01.9 02.4	168 06.5 12.2	53 56.2 08.7	298 48.1 120 2 01.6 +138					
	6	296 34.1	301 56.7 - 3 49.7	233 02.6 +22 02.7	183 08.7 +22 12.2	68 58.9 -15 08.7	313 19.1 119 - 1 47.8 +139					
	7	311 36.5	316 56.3 48.6	248 03.2 03.0	198 10.9 12.2	84 01.5 08.6	327 50.0 119 1 33.9 +139					
	8	326 39.0	331 56.0 47.5	263 03.9 03.3	213 13.1 12.1	99 04.1 08.6	342 20.9 118 1 20.0 +139					
	9	341 41.5	346 55.7 .. 46.4	278 04.6 .. 03.6	228 15.3 .. 12.1	114 06.8 .. 08.5	356 51.7 119 .. 1 06.1 +140					
	10	356 43.9	1 55.4 45.2	293 05.3 04.0	243 17.5 12.0	129 09.4 08.5	11 22.6 117 0 52.1 +140					
	11	11 46.4	16 55.1 44.1	308 06.0 04.3	258 19.7 12.0	144 12.0 08.4	25 53.3 118 0 38.1 +140					
	12	26 48.9	31 54.7 - 3 43.0	323 06.7 +22 04.6	273 21.9 +22 12.0	159 14.7 -15 08.4	40 24.1 116 - 0 24.1 +140					
	13	41 51.3	46 54.4 41.9	338 07.3 04.9	288 24.1 11.9	174 17.3 08.3	54 54.7 117 - 0 10.1 +140					
	14	56 53.8	61 54.1 40.8	353 08.0 05.2	303 26.3 11.9	189 19.9 08.3	69 25.4 116 + 0 03.9 +141					
	15	71 56.3	76 53.8 .. 39.7	8 08.7 .. 05.5	318 28.5 .. 11.9	204 22.6 .. 08.2	83 56.0 115 .. 0 18.0 +141					
	16	86 58.7	91 53.5 38.6	23 09.4 05.8	333 30.7 11.8	219 25.2 08.2	98 26.5 116 0 32.1 +141					
	17	102 01.2	106 53.1 37.4	38 10.1 06.1	348 32.9 11.8	234 27.8 08.2	112 57.1 114 0 46.2 +141					
	18	117 03.7	121 52.8 - 3 36.3	53 10.7 +22 06.5	3 35.1 +22 11.7	249 30.5 -15 08.1	127 27.5 114 + 1 00.3 +141					
	19	132 06.1	136 52.5 35.2	68 11.4 06.8	18 37.3 11.7	264 33.1 08.1	141 57.9 114 1 14.4 +141					
	20	147 08.6	151 52.2 34.1	83 12.1 07.1	33 39.5 11.7	279 35.7 08.0	156 28.3 113 1 28.5 +142					
	21	162 11.0	166 51.9 .. 33.0	98 12.8 .. 07.4	48 41.7 .. 11.6	294 38.4 .. 08.0	170 58.6 113 .. 1 42.7 +141					
	22	177 13.5	181 51.6 31.8	113 13.5 07.7	63 43.9 11.6	309 41.0 07.9	185 28.9 112 1 56.8 +142					
	23	192 16.0	196 51.2 30.7	128 14.1 08.0	78 46.1 11.5	324 43.6 07.9	199 59.1 112 2 11.0 +142					
20	0	207 18.4	211 50.9 - 3 29.6	143 14.8 +22 08.3	93 48.3 +22 11.5	339 46.3 -15 07.8	214 29.3 111 + 2 25.2 +141					
	1	222 20.9	226 50.6 28.5	158 15.5 08.6	108 50.5 11.5	354 48.9 07.8	228 59.4 110 2 39.3 +142					
	2	237 23.4	241 50.3 27.4	173 16.2 08.9	123 52.6 11.4	9 51.5 07.7	243 29.4 110 2 53.5 +142					
	3	252 25.8	256 50.0 .. 26.3	188 16.9 .. 09.2	138 54.8 .. 11.4	24 54.2 .. 07.7	257 59.4 110 .. 3 07.7 +142					
	4	267 28.3	271 49.7 25.1	203 17.5 09.5	153 57.0 11.3	39 56.8 07.6	272 29.4 109 3 21.9 +142					
	5	282 30.8	286 49.3 24.0	218 18.2 09.9	168 59.2 11.3	54 59.4 07.6	286 59.3 108 3 36.1 +142					
	6	297 33.2	301 49.0 - 3 22.9	233 18.9 +22 10.2	184 01.4 +22 11.3	70 02.1 -15 07.5	301 29.1 107 + 3 50.3 +141					
	7	312 35.7	316 48.7 21.8	248 19.6 10.5	199 03.6 11.2	85 04.7 07.5	315 58.8 108 4 04.4 +142					
	8	327 38.2	331 48.4 20.7	263 20.3 10.8	214 05.8 11.2	100 07.3 07.4	330 28.6 106 4 18.6 +142					
	9	342 40.6	346 48.1 .. 19.5	278 20.9 .. 11.1	229 08.0 .. 11.1	115 10.0 .. 07.4	344 58.2 106 .. 4 32.8 +141					
	10	357 43.1	1 47.7 18.4	293 21.6 11.4	244 10.2 11.1	130 12.6 07.3	359 27.8 105 4 46.9 +142					
	11	12 45.5	16 47.4 17.3	308 22.3 11.7	259 12.4 11.1	145 15.2 07.3	13 57.3 105 5 01.1 +141					
	12	27 48.0	31 47.1 - 3 16.2	323 23.0 +22 12.0	274 14.6 +22 11.0	160 17.9 -15 07.2	28 26.8 103 + 5 15.2 +141					
	13	42 50.5	46 46.8 15.1	338 23.7 12.3	289 16.8 11.0	175 20.5 07.2	42 56.1 104 5 29.3 +142					
	14	57 52.9	61 46.5 13.9	353 24.3 12.6	304 19.0 10.9	190 23.1 07.1	57 25.5 102 5 43.5 +141					
	15	72 55.4	76 46.2 .. 12.8	8 25.0 .. 12.9	319 21.2 .. 10.9	205 25.8 .. 07.1	71 54.7 102 .. 5 57.6 +140					
	16	87 57.9	91 45.8 11.7	23 25.7 13.2	334 23.4 10.9	220 28.4 07.0	86 23.9 101 6 11.6 +141					
	17	103 00.3	106 45.5 10.6	38 26.4 13.5	349 25.6 10.8	235 31.0 07.0	100 53.0 101 6 25.7 +140					
	18	118 02.8	121 45.2 - 3 09.4	53 27.1 +22 13.8	4 27.7 +22 10.8	250 33.7 -15 06.9	115 22.1 100 + 6 39.7 +141					
	19	133 05.3	136 44.9 08.3	68 27.7 14.1	19 29.9 10.7	265 36.3 06.9	129 51.1 99 6 53.8 +140					
	20	148 07.7	151 44.6 07.2	83 28.4 14.4	34 32.1 10.7	280 38.9 06.8	144 20.0 98 7 07.8 +139					
	21	163 10.2	166 44.3 .. 06.1	98 29.1 .. 14.7	49 34.3 .. 10.7	295 41.6 .. 06.8	158 48.8 98 .. 7 21.7 +140					
	22	178 12.6	181 43.9 05.0	113 29.8 15.0	64 36.5 10.6	310 44.2 06.7	173 17.6 97 7 35.7 +139					
	23	193 15.1	196 43.6 03.8	128 30.5 15.3	79 38.7 10.6	325 46.8 06.7	187 46.3 96 7 49.6 +139					
21	0	208 17.6	211 43.3 - 3 02.7	143 31.1 +22 15.6	94 40.9 +22 10.5	340 49.5 -15 06.6	202 14.9 95 + 8 03.5 +138					
	1	223 20.0	226 43.0 01.6	158 31.8 15.9	109 43.1 10.5	355 52.1 06.6	216 43.4 95 8 17.3 +139					
	2	238 22.5	241 42.7 3 00.5	173 32.5 16.2	124 45.3 10.5	10 54.7 06.6	231 11.9 94 8 31.2 +137					
	3	253 25.0	256 42.4 .. 2 59.3	188 33.2 .. 16.5	139 47.5 .. 10.4	25 57.4 .. 06.5	245 40.3 93 .. 8 44.9 +138					
	4	268 27.4	271 42.1 58.2	203 33.8 16.8	154 49.6 10.4	41 00.0 06.5	260 08.6 93 8 58.7 +137					
	5	283 29.9	286 41.7 57.1	218 34.5 17.1	169 51.8 10.3	56 02.6 06.4	274 36.9 91 9 12.4 +137					
	6	298 32.4	301 41.4 - 2 56.0	233 35.2 +22 17.4	184 54.0 +22 10.3	71 05.3 -15 06.4	289 05.0 91 + 9 26.1 +136					
	7	313 34.8	316 41.1 54.8	248 35.9 17.7	199 56.2 10.3	86 07.9 06.3	303 33.1 90 9 39.7 +136					
	8	328 37.3	331 40.8 53.7	263 36.6 18.0	214 58.4 10.2	101 10.5 06.3	318 01.1 89 9 53.3 +135					
	9	343 39.8	346 40.5 .. 52.6	278 37.2 .. 18.3	230 00.6 .. 10.2	116 13.2 .. 06.2	332 29.0 88 .. 10 06.8 +135					
	10	358 42.2	1 40.2 51.5	293 37.9 18.6	245 02.8 10.1	131 15.8 06.2	346 56.8 88 10 20.3 +134					
	11	13 44.7	16 39.9 50.3	308 38.6 18.9	260 05.0 10.1	146 18.5 06.1	1 24.6 87 10 33.7 +134					
	12	28 47.1	31 39.5 - 2 49.2	323 39.3 +22 19.2	275 07.1 +22 10.1	161 21.1 -15 06.1	15 52.3 85 +10 47.1 +134					
	13	43 49.6	46 39.2 48.1	338 40.0 19.5	290 09.3 10.0	176 23.7 06.0	30 19.8 85 11 00.5 +133					
	14	58 52.1	61 38.9 47.0	353 40.6 19.8	305 11.5 10.0	191 26.4 06.0	44 47.3 85 11 13.8 +132					
	15	73 54.5	76 38.6 .. 45.8	8 41.3 .. 20.1	320 13.7 .. 09.9	206 29.0 .. 05.9	59 14.8 83 .. 11 27.0 +131					
	16	88 57.0	91 38.3 44.7	23 42.0 20.4	335 15.9 09.9	221 31.6 05.9	73 42.1 82 11 40.1 +131					
	17	103 59.5	106 38.0 43.6	38 42.7 20.7	350 18.1 09.8	236 34.3 05.8	88 09.3 82 11 53.2 +131					
	18	119 01.9	121 37.6 - 2 42.4	53 43.3 +22 21.0	5 20.3 +22 09.8	251 36.9 -15 05.8	102 36.5 81 +12 06.3 +130					
	19	134 04.4	136 37.3 41.3	68 44.0 21.3	20 22.4 09.8	266 39.5 05.7	117 03.6 79 12 19.3 +129					
	20	149 06.9	151 37.0 40.2	83 44.7 21.6	35 24.6 09.7	281 42.2 05.7	131 30.5 79 12 32.2 +128					
	21	164 09.3	166 36.7 .. 39.1	98 45.4 .. 21.9	50 26.8 .. 09.7	296 44.8 .. 05.6	145 57.4 79 .. 12 45.0 +128					
	22	179 11.8	181 36.4 37.9	113 46.1 22.2	65 29.0 09.6	311 47.5 05.6	160 24.3 77 12 57.8 +127					
	23	194 14.2	196 36.1 36.8	128 46.7 22.5	80 31.2 09.6	326 50.1 05.5	174 51.0 76 13 10.5 +126					
24	0	209 16.7	211 35.8 - 2 35.7	143 47.4 +22 22.8	95 33.4 +22 09.6	341 52.7 -15 05.5	189 17.6 76 +13 23.1 +126					
code		- 3 + 11	+ 7 + 3	+ 22 0	+ 26 0							

G M T	T GHA	VENUS -3.4		MARS 1.8		JUPITER -1.7		SATURN 0.3		MOON			
		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
		h	m	s	°	'	"	h	m	s	°	'	"
22	0	209 16.7	211 35.8	- 2 35.7	143 47.4	+22 22.8	95 33.4	+22 09.6	341 52.7	-15 05.5	189 17.6	76 +13	23.1 +126
	1	224 19.2	226 35.4	34.6	158 48.1	23.1	110 35.5	09.5	356 55.4	05.4	203 44.2	74 13	35.7 +125
	2	239 21.6	241 35.1	33.4	173 48.8	23.4	125 37.7	09.5	11 58.0	05.4	218 10.6	74 13	48.2 +124
	3	254 24.1	256 34.8	.. 32.3	188 49.4	.. 23.7	140 39.9	.. 09.4	27 00.6	.. 05.3	232 37.0	73 14	00.6 +123
	4	269 26.6	271 34.5	31.2	203 50.1	24.0	155 42.1	09.4	42 03.3	05.3	247 03.7	71 14	12.9 +122
	5	284 29.0	286 34.2	30.0	218 50.8	24.2	170 44.3	09.3	57 05.9	05.2	261 29.4	71 14	25.1 +122
	6	299 31.5	301 33.9	- 2 28.9	233 51.5	+22 24.5	185 46.4	+22 09.3	72 08.5	-15 05.2	275 55.5	71 +14	37.3 +120
	7	314 34.0	316 33.6	27.8	248 52.1	24.8	200 48.6	09.3	87 11.2	05.1	290 21.6	69 14	49.3 +120
	8	329 36.4	331 33.3	26.6	263 52.8	25.1	215 50.8	09.2	102 13.8	05.1	304 47.5	68 15	01.3 +119
	9	344 38.9	346 32.9	.. 25.5	278 53.5	.. 25.4	230 53.0	.. 09.2	117 16.5	.. 05.0	319 13.3	67 15	13.2 +118
	10	359 41.4	1 32.6	24.4	293 54.2	25.7	245 55.2	09.1	132 19.1	05.0	333 39.0	67 15	25.0 +117
	11	14 43.8	16 32.3	23.3	308 54.8	26.0	260 57.3	09.1	147 21.7	04.9	348 04.7	66 15	36.7 +116
	12	29 46.3	31 32.0	- 2 22.1	323 55.5	+22 26.3	275 59.5	+22 09.1	162 24.4	-15 04.9	2 30.3	64 +15	48.3 +114
	13	44 48.7	46 31.7	21.0	338 56.2	26.6	291 01.7	09.0	177 27.0	04.8	16 55.7	64 15	59.7 +114
	14	59 51.2	61 31.4	19.9	353 56.9	26.9	306 03.9	09.0	192 29.6	04.8	31 21.1	63 16	11.1 +113
	15	74 53.7	76 31.1	.. 18.7	8 57.6	.. 27.1	321 06.1	.. 08.9	207 32.3	.. 04.7	45 46.4	62 16	22.4 +112
	16	89 56.1	91 30.8	17.6	23 58.2	27.4	336 08.2	08.9	222 34.9	04.7	60 11.6	61 16	33.6 +111
	17	104 58.6	106 30.4	16.5	38 58.9	27.7	351 10.4	08.8	237 37.6	04.6	74 36.7	60 16	44.7 +110
	18	120 01.1	121 30.1	- 2 15.3	53 59.6	+22 28.0	6 12.6	+22 08.8	252 40.2	-15 04.6	89 01.7	60 +16	55.7 +109
	19	135 03.5	136 29.8	14.2	69 00.3	28.3	21 14.8	08.8	267 42.8	04.5	103 26.7	58 17	06.6 +107
	20	150 06.0	151 29.5	13.1	84 00.9	28.6	36 17.0	08.7	282 45.5	04.5	117 51.5	58 17	17.3 +107
	21	165 08.5	166 29.2	.. 11.9	99 01.6	.. 28.9	51 19.1	.. 08.7	297 48.1	.. 04.4	132 16.3	57 17	28.0 +105
	22	180 10.9	181 28.9	10.8	114 02.3	29.2	66 21.3	08.6	312 50.7	04.4	146 41.0	55 17	38.5 +104
	23	195 13.4	196 28.6	09.7	129 03.0	29.4	81 23.5	08.6	327 53.4	04.3	161 05.5	56 17	48.9 +103
23	0	210 15.9	211 28.3	- 2 08.6	144 03.6	+22 29.7	96 25.7	+22 08.5	342 56.0	-15 04.3	175 30.1	54 +17	59.2 +102
	1	225 18.3	226 27.9	07.4	159 04.3	30.0	111 27.8	08.5	357 58.7	04.2	189 54.5	53 18	09.4 +100
	2	240 20.8	241 27.6	06.3	174 05.0	30.3	126 30.0	08.5	13 01.3	04.2	204 18.8	52 18	19.4 +100
	3	255 23.2	256 27.3	.. 05.2	189 05.7	.. 30.6	141 32.2	.. 08.4	28 03.9	.. 04.1	218 43.0	52 18	29.4 + 98
	4	270 25.7	271 27.0	04.0	204 06.3	30.9	156 34.4	08.4	43 06.6	04.1	233 07.2	51 18	39.2 + 96
	5	285 28.2	286 26.7	02.9	219 07.0	31.1	171 36.5	08.3	58 09.2	04.0	247 31.3	50 18	48.8 + 96
	6	300 30.6	301 26.4	- 2 01.8	234 07.7	+22 31.4	186 38.7	+22 08.3	73 11.9	-15 04.0	261 55.3	49 +18	58.4 + 94
	7	315 33.1	316 26.1	2 00.6	249 08.4	31.7	201 40.9	08.2	88 14.5	04.0	276 19.2	49 19	07.8 + 93
	8	330 35.6	331 25.8	1 59.5	264 09.0	32.0	216 43.1	08.2	103 17.1	03.9	290 43.1	47 19	17.1 + 91
	9	345 38.0	346 25.4	.. 58.4	279 09.7	.. 32.3	231 45.2	.. 08.2	118 19.8	.. 03.9	305 06.8	47 19	26.2 + 90
	10	0 40.5	1 25.1	57.2	294 10.4	32.6	246 47.4	08.1	133 22.4	03.8	319 30.5	46 19	35.2 + 89
	11	15 43.0	16 24.8	56.1	309 11.1	32.8	261 49.6	08.1	148 25.0	03.8	333 54.1	46 19	44.1 + 87
	12	30 45.4	31 24.5	- 1 55.0	324 11.7	+22 33.1	276 51.8	+22 08.0	163 27.7	-15 03.7	348 17.7	44 +19	52.8 + 86
	13	45 47.9	46 24.2	53.8	339 12.4	33.4	291 53.9	08.0	178 30.3	03.7	2 41.1	44 20	01.4 + 84
	14	60 50.3	61 23.9	52.7	354 13.1	33.7	306 56.1	07.9	193 33.0	03.6	17 04.5	43 20	09.8 + 83
	15	75 52.8	76 23.6	.. 51.5	9 13.8	.. 34.0	321 58.3	.. 07.9	208 35.6	.. 03.6	31 27.8	43 20	18.1 + 82
	16	90 55.3	91 23.3	50.4	24 14.4	34.2	337 00.5	07.9	223 38.2	03.5	45 51.1	41 20	26.3 + 80
	17	105 57.7	106 23.0	49.3	39 15.1	34.5	352 02.6	07.8	238 40.9	03.5	60 14.2	41 20	34.3 + 79
	18	121 00.2	121 22.7	- 1 48.1	54 15.8	+22 34.8	7 04.8	+22 07.8	253 43.5	-15 03.4	74 37.3	41 +20	42.2 + 77
	19	136 02.7	136 22.3	47.0	69 16.5	35.1	22 07.0	07.7	268 46.2	03.4	89 00.4	40 20	49.9 + 76
	20	151 05.1	151 22.0	45.9	84 17.1	35.4	37 09.1	07.7	283 48.8	03.3	103 23.4	39 20	57.5 + 74
	21	166 07.6	166 21.7	.. 44.7	99 17.8	.. 35.6	52 11.3	.. 07.6	298 51.4	.. 03.3	117 46.3	38 21	04.9 + 72
	22	181 10.1	181 21.4	43.6	114 18.5	35.9	67 13.5	07.6	313 54.1	03.2	132 09.1	38 21	12.1 + 71
	23	196 12.5	196 21.1	42.5	129 19.2	36.2	82 15.7	07.5	328 56.7	03.2	146 31.9	37 21	19.2 + 70
24	0	211 15.0	211 20.8	- 1 41.3	144 19.8	+22 36.5	97 17.8	+22 07.5	343 59.4	-15 03.1	160 54.6	37 +21	26.2 + 68
	1	226 17.5	226 20.5	40.2	159 20.5	36.8	112 20.0	07.5	359 02.0	03.1	175 17.3	36 21	33.0 + 66
	2	241 19.9	241 20.2	39.1	174 21.2	37.0	127 22.2	07.4	14 04.6	03.0	189 39.9	36 21	39.6 + 64
	3	256 22.4	256 19.9	.. 37.9	189 21.8	.. 37.3	142 24.3	.. 07.4	29 07.3	.. 03.0	204 02.5	35 21	46.0 + 64
	4	271 24.8	271 19.5	36.8	204 22.5	37.6	157 26.5	07.3	44 09.9	02.9	218 25.0	35 21	52.4 + 61
	5	286 27.3	286 19.2	35.6	219 23.2	37.9	172 28.7	07.3	59 12.6	02.9	232 47.5	34 21	58.5 + 60
	6	301 29.8	301 18.9	- 1 34.5	234 23.9	+22 38.1	187 30.8	+22 07.2	74 15.2	-15 02.8	247 09.9	34 +22	04.5 + 58
	7	316 32.2	316 18.6	33.4	249 24.5	38.4	202 33.0	07.2	89 17.8	02.8	261 32.3	33 22	10.3 + 56
	8	331 34.7	331 18.3	32.2	264 25.2	38.7	217 35.2	07.1	104 20.5	02.7	275 54.6	33 22	15.9 + 55
	9	346 37.2	346 18.0	.. 31.1	279 25.9	.. 39.0	232 37.3	.. 07.1	119 23.1	.. 02.7	290 16.9	32 22	21.4 + 53
	10	1 39.6	1 17.7	30.0	294 26.6	39.2	247 39.5	07.1	134 25.8	02.6	304 39.1	32 22	26.7 + 52
	11	16 42.1	16 17.4	28.8	309 27.2	39.5	262 41.7	07.0	149 28.4	02.6	319 01.3	32 22	31.9 + 50
	12	31 44.6	31 17.1	- 1 27.7	324 27.9	+22 39.8	277 43.8	+22 07.0	164 31.0	-15 02.5	333 23.5	31 +22	36.9 + 48
	13	46 47.0	46 16.8	26.5	339 28.6	40.1	292 46.0	06.9	179 33.7	02.5	347 45.6	31 22	41.7 + 46
	14	61 49.5	61 16.4	25.4	354 29.3	40.3	307 48.2	06.9	194 36.3	02.4	2 07.7	31 22	46.3 + 45
	15	76 52.0	76 16.1	.. 24.3	9 29.9	.. 40.6	322 50.3	.. 06.8	209 39.0	.. 02.4	16 29.8	30 22	50.8 + 43
	16	91 54.4	91 15.8	23.1	24 30.6	40.9	337 52.5	06.8	224 41.6	02.3	30 51.8	30 22	55.1 + 41
	17	106 56.9	106 15.5	22.0	39 31.3	41.1	352 54.7	06.7	239 44.2	02.3	45 13.8	30 22	59.2 + 40
	18	121 59.3	121 15.2	- 1 20.9	54 32.0	+22 41.4	7 56.8	+22 06.7	254 46.9	-15 02.2	59 35.8	30 +23	03.2 + 37
	19	137 01.8	136 14.9	19.7	69 32.6	41.7	22 59.0	06.7	269 49.5	02.2	73 57.8	30 23	06.9 + 36
	20	152 04.3	151 14.6	18.6	84 33.3	42.0	38 01.2	06.6	284 52.2	02.1	88 19.8	29 23	10.5 + 35
	21	167 06.7	166 14.3	.. 17.4	99 34.0	.. 42.2	53 03.3	.. 06.6	299 54.8	.. 02.1	102 41.7	29 23	14.0 + 32
	22	182 09.2	181 14.0	16.3	114 34.6	42.5	68 05.5	06.5	314 57.5	02.0	117 03.6	29 23	17.2 + 31
	23	197 11.7	196 13.7	15.2	129 35.3	42.8	83 07.7	06.5	330 00.1	02.0	131 25.5	29 23	20.3 + 29
24	0	212 14.1	211 13.3	- 1 14.0	144 36.0	+22 43.0	98 09.8	+22 06.4	345 02.7	-15 01.9	145 47.4	29 +23	23.2 + 27
code		-	- 3	+ 12	+ 7	+ 3	+ 21	0	+ 26	0			

22

0

180 19.1 +11 51.6

1

195 19.2

52.4

2

210 19.4

53.3

3

225 19.5 ..

54.1

4

240 19.6

55.0

5

255 19.8

55.8

6

270 19.9 +11 56.7

7

285 20.0

57.5

8

300 20.1

58.4

9

315 20.3 -11 59.2

10

330 20.4 12 00.0

11

345 20.5

00.9

12

0 20.6 +12 01.7

13

15 20.8

02.6

14

30 20.9

03.4

15

45 21.0 ..

04.3

16

60 21.1

05.1

17

75 21.3

06.0

18

90 21.4 +12 06.8

19

105 21.5

07.6

20

120 21.6

08.5

21

135 21.8 ..

09.3

22

150 21.9

10.2

23

165 22.0

11.0

23

0

180 22.1 +12 11.9

1

195 22.2

12.7

2

210 22.4

13.5

3

225 22.5 ..

14.4

4

240 22.6

15.2

5

255 22.7

16.1

6

270 22.9 +12 16.9

7

285 23.0

17.7

8

300 23.1

18.6

9

315 23.2 ..

19.4

10

330 23.3

20.2

11

345 23.5

21.1

12

0 23.6 +12 21.9

13

15 23.7

22.8

14

30 23.8

23.6

15

45 23.9 ..

24.4

16

60 24.1

25.3

17

75 24.2

26.1

18

90 24.3 +12 26.9

19

105 24.4

27.8

20

120 24.5

28.6

21

135 24.7 ..

29.4

22

150 24.8

30.3

23

165 24.9

31.1

24

0

180 25.0 +12 31.9

1

195 25.1

32.8

2

210 25.2

33.6

3

225 25.4 ..

34.4

4

240 25.5

35.3

5

255 25.6

36.1

6

270 25.7 +12 36.9

7

285 25.8

37.8

8

300 25.9

38.6

9

315 26.1 ..

39.4

10

330 26.2

40.2

11

345 26.3

41.1

12

0 26.4 +12 41.9

13

15 26.5

42.7

14

30 26.6

43.6

15

45 26.8 ..

44.4

16

60 26.9

45.2

17

75 27.0

46.0

18

90 27.1 +12 46.9

19

105 27.2

47.7

20

120 27.3

48.5

21

135 27.4 ..

49.3

22

150 27.6

50.2

23

165 27.7

51.0

24

0

180 27.8 +12 51.8

No.

Name

SHA

Dec.

7

Acamar

315 51.7

-40 29.0

5

Achernar

335 59.6

-57 27.7

30

Acrux

173 57.6

-62 51.4

19

Adhara

255 46.9

-28 54.9

10

Aldebaran

291 39.7

+16 25.2

32

Alioth

166 58.2

+56 12.1

34

Alkaid

153 32.6

+49 32.0

55

Al Na'ir

28 38.5

-47 10.5

15

Alnilam

276 30.8

-1 13.8

25

Alphard

218 38.8

-8 28.1

41

Alphecca

126 47.5

+26 51.6

1

Alpheratz

358 29.0

+28 50.6

51

Altair

62 50.7

+8 44.8

2

Ankaa

353 58.9

-42 32.8

42

Antares

113 19.5

-26 20.1

37

Arcturus

146 35.1

+19 24.7

43

Atria

109 00.1

-68 56.8

22

Avior

234 35.9

-59 22.3

13

Bellatrix

279 19.0

+6 18.6

16

Betelge'se

271 48.7

+7 24.0

17

Canopus

264 15.8

-52 40.5

12

Capella

281 39.2

+45 57.4

53

Deneb

50 01.3

+45 07.0

28

Denebola

183 17.8

+14 49.2

4

Diphda

349 39.9

-18 13.9

27

Dubhe

194 44.5

+61 59.6

14

Elath

279 08.0

+28 34.3

47

Eltanin

91 06.1

+51 29.3

54

Enif

34 30.0

+9 40.1

56

Fomalhaut

16 12.2

-29 51.4

31

Gacrux

172 49.1

-56 52.1

29

Gienah

176 36.9

-17 17.9

35

Hadar

149 49.3

-60 09.7

6

Hamal

328 50.4

+23 15.1

48

Kaus Aust.

84 41.4

-34 24.4

40

Kochab

137 16.6

+74 20.1

57

Markab

14 22.0

+14 57.8

8

Menkar

315 01.0

+3 54.9

36

Menkent

148 58.7

-36 09.3

24

Miapl'dus

221 49.0

-69 32.4

9

Mirfak

309 43.3

+49 42.3

50

Nunki

76 52.1

-26 21.2

52

Peacock

54 27.8

-56 52.5

21

Pollux

244 21.0

+28 08.2

20

Procyon

245 45.4

+5 20.3

46

R'alhague

96 46.7

+12 35.3

26

Regulus

208 29.7

+12 11.0

11

Rigel

281 54.2

-8 15.2

38

Rigil Kent.

140 50.8

-60 39.3

44

Sabik

103 02.3

-15 40.4

3

Schedar

350 30.9

+56 17.5

45

Shaula

97 20.8

-37 04.4

18

Sirius

259 12.3

-16 39.4

33

Spica

159 16.9

-10 55.9

23

Suhail

223 24.5

-43 15.4

49

Vega

81 08.3

+38 44.2

39

Zub'g'bi

137 53.4

-15 51.6

G M T

Equation of Time (App.—Mean)

22

23

24

DAY

Moon

Venus

Mars

Jupiter

Saturn

22

11 50

9 54

14 24

17 35

1 12

23

12 49

9 54

14 23

17 32

1 08

24

13 51

9 55

14 22

17 28

1 04

25

14 55

9 55

14 21

17 25

1 00

Alt.

Sun's Low r Add

Venus Add

Mars Add

0

0.2

0.1

0.1

30

0.2

0.1

0.0

45

0.2

0.1

0.0

60

0.2

0.0

0.0

75

0.2

0.0

0.0

90

0.2

0.0

0.0

Moon's Lower Limb

Add

Alt.

22

23

24

0

20.3

20.6

20.5

8

20.2

20.6

20.5

12

20.1

20.5

20.4

16

20.1

20.4

20.3

20

20.0

20.4

20.2

24

19.9

20.2

20.1

28

19.8

20.1

20.0

32

19.6

20.0

19.8

36

19.5

19.8

19.7

40

19.3

19.6

19.5

44

19.1

19.4

19.3

48

18.9

19.2

19.1

52

18.7

19.0

18.9

56

18.5

18.8

18.7

60

18.3

18.5

18.4

64

18.1

18.3

18.2

68

17.8

18.0

17.9

72

17.6

17.7

17.7

76

17.3

17.5

17.4

80

17.1

17.2

17.2

84

16.8

16.9

16.9

88

16.6

16.7

16.7

90

16.6

16.7

16.7

Add to table, back cover

Moon's Upper Limb

Subtract

Alt.

22

23

24

0

12.9

12.6

12.7

8

12.9

12.7

12.7

12

13.0

12.8

12.8

16

13.0

12.8

12.9

20

13.1

12.9

13.0

24

13.2

13.0

13.1

28

13.4

13.2

13.2

32

13.5

13.3

13.4

36

13.6

13.5

13.5

40

13.8

13.7

13.7

44

14.0

13.9

13.9

48

14.2

14.1

14.1

52

14.4

14.3

14.3

56

14.6

14.5

14.5

60

14.8

14.8

14.8

64

15.1

15.0

15.0

68

15.3

15.3

15.3

72

15.5

15.5

15.5

76

15.8

15.8

15.8

80

16.0

16.1

16.1

84

16.3

16.4

16.3

88

16.5

16.6

16.5

90

16.5

16.6

16.5

Subtract from table, back cover

DAY

Moon

Venus

Mars

Jupiter

Saturn

22

11 50

9 54

14 24

17 35

1 12

23

12 49

9 54

14 23

17 32

1 08

24

13 51

9 55

14 22

17 28

1 04

25

14 55

9 55

14 21

17 25

1 00

New Moon

code

-

+ 9

22

23

24

25

G M T	VENUS -3.4		MARS 1.8		JUPITER -1.7		SATURN 0.3		MOON					
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code		
25	h													
	0	212 14.1	211 13.3 - 1	144 36.0 +22	43.0	98 09.8 +22	06.4	345 02.7 -15	01.9	145 47.4	29	+23	23.2 + 27	
	1	227 16.6	226 13.0	159 36.7	43.3	113 12.0	06.4	0 05.4	01.9	160 09.3	29	23	25.9 + 26	
	2	242 19.1	241 12.7	174 37.3	43.6	128 14.2	06.3	15 08.0	01.8	174 31.2	29	23	28.5 + 23	
	3	257 21.5	256 12.4 ..	189 38.0 ..	43.8	143 16.3 ..	06.3	30 10.7 ..	01.8	188 53.1	29	23	30.8 + 22	
	4	272 24.0	271 12.1	204 38.7	44.1	158 18.5	06.2	45 13.3	01.7	203 15.0	29	23	33.0 + 20	
	5	287 26.5	286 11.8	219 39.3	44.4	173 20.6	06.2	60 15.9	01.7	217 36.9	29	23	35.0 + 19	
	6	302 28.9	301 11.5 - 1	234 40.0 +22	44.6	188 22.8 +22	06.2	75 18.6 -15	01.6	231 58.8	29	+23	36.9 + 16	
	7	317 31.4	316 11.2	249 40.7	44.9	203 25.0	06.1	90 21.2	01.6	246 20.7	29	23	38.5 + 15	
	8	332 33.8	331 10.9	264 41.4	45.2	218 27.1	06.1	105 23.9	01.5	260 42.6	29	23	40.0 + 13	
	9	347 36.3	346 10.6 ..	279 42.0 ..	45.4	233 29.3 ..	06.0	120 26.5 ..	01.5	275 04.5	29	23	41.3 + 12	
	10	2 38.8	1 10.3	294 42.7	45.7	248 31.5	06.0	135 29.1	01.4	289 26.4	30	23	42.5 + 9	
	11	17 41.2	16 09.9	309 43.4	46.0	263 33.6	05.9	150 31.8	01.4	303 48.4	30	23	43.4 + 8	
	12	32 43.7	31 09.6 - 1	324 44.1 +22	46.2	278 35.8 +22	05.9	165 34.4 -15	01.3	318 10.4	30	+23	44.2 + 6	
	13	47 46.2	46 09.3	339 44.7	46.5	293 37.9	05.8	180 37.1	01.3	332 32.4	30	23	44.8 + 4	
	14	62 48.6	61 09.0	354 45.4	46.8	308 40.1	05.8	195 39.7	01.2	346 54.4	30	23	45.2 + 3	
	15	77 51.1	76 08.7 ..	9 46.1 ..	47.0	323 42.3 ..	05.7	210 42.4 ..	01.2	1 16.4	31	23	45.5 + 1	
	16	92 53.6	91 08.4	24 46.7	47.3	338 44.4	05.7	225 45.0	01.1	15 38.5	31	23	45.6 - 1	
	17	107 56.0	106 08.1	39 47.4	47.6	353 46.6	05.7	240 47.6	01.1	30 00.6	31	23	45.5 - 3	
	18	122 58.5	121 07.8 - 0	54 48.1 +22	47.8	8 48.7 +22	05.6	255 50.3 -15	01.0	44 22.7	32	+23	45.2 - 5	
	19	138 00.9	136 07.5	69 48.8	48.1	23 50.9	05.6	270 52.9	01.0	58 44.9	32	23	44.7 - 6	
	20	153 03.4	151 07.2	84 49.4	48.4	38 53.1	05.5	285 55.6	00.9	73 07.1	32	23	44.1 - 8	
	21	168 05.9	166 06.9 ..	99 50.1 ..	48.6	53 55.2 ..	05.5	300 58.2 ..	00.9	87 29.3	33	23	43.3 - 10	
	22	183 08.3	181 06.5	114 50.8	48.9	68 57.4	05.4	316 00.9	00.8	101 51.6	33	23	42.3 - 11	
	23	198 10.8	196 06.2	129 51.4	49.1	83 59.5	05.4	331 03.5	00.8	116 13.9	34	23	41.2 - 13	
26	0	213 13.3	211 05.9 - 0	46.6	144 52.1 +22	49.4	99 01.7 +22	05.3	346 06.1 -15	00.7	130 36.3	34	+23	39.9 - 15
	1	228 15.7	226 05.6	45.5	159 52.8	49.7	114 03.8	05.3	1 08.8	00.7	144 58.7	35	23	38.4 - 16
	2	243 18.2	241 05.3	44.4	174 53.5	49.9	129 06.0	05.2	16 11.4	00.6	159 21.2	35	23	36.8 - 19
	3	258 20.7	256 05.0 ..	43.2	189 54.1 ..	50.2	144 08.2 ..	05.2	31 14.1 ..	00.6	173 43.7	36	23	34.9 - 20
	4	273 23.1	271 04.7	42.1	204 54.8	50.4	159 10.3	05.1	46 16.7	00.5	188 06.3	36	23	32.9 - 21
	5	288 25.6	286 04.4	40.9	219 55.5	50.7	174 12.5	05.1	61 19.4	00.5	202 28.9	37	23	30.8 - 23
	6	303 28.1	301 04.1 - 0	39.8	234 56.1 +22	51.0	189 14.6 +22	05.1	76 22.0 -15	00.4	216 51.6	38	+23	28.5 - 25
	7	318 30.5	316 03.8	38.6	249 56.8	51.2	204 16.8	05.0	91 24.6	00.4	231 14.4	38	23	26.0 - 27
	8	333 33.0	331 03.5	37.5	264 57.5	51.5	219 18.9	05.0	106 27.3	00.3	245 37.2	39	23	23.3 - 28
	9	348 35.4	346 03.2 ..	36.4	279 58.1 ..	51.7	234 21.1 ..	04.9	121 29.9 ..	00.3	260 00.1	39	23	20.5 - 30
	10	3 37.9	1 02.8	35.2	294 58.8	52.0	249 23.2	04.9	136 32.6	00.2	274 23.0	40	23	17.5 - 31
	11	18 40.4	16 02.5	34.1	309 59.5	52.2	264 25.4	04.8	151 35.2	00.2	288 46.0	41	23	14.4 - 33
	12	33 42.8	31 02.2 - 0	32.9	325 00.2 +22	52.5	279 27.6 +22	04.8	166 37.9 -15	00.1	303 09.1	42	+23	11.1 - 35
	13	48 45.3	46 01.9	31.8	340 00.8	52.8	294 29.7	04.7	181 40.5	00.1	317 32.3	42	23	07.6 - 36
	14	63 47.8	61 01.6	30.6	355 01.5	53.0	309 31.9	04.7	196 43.1	00.0	331 55.5	43	23	04.0 - 38
	15	78 50.2	76 01.3 ..	29.5	10 02.2 ..	53.3	324 34.0 ..	04.6	211 45.8 -15	00.0	346 18.8	44	23	00.2 - 40
	16	93 52.7	91 01.0	28.4	25 02.8	53.5	339 36.2	04.6	226 48.4	14 59.9	0 42.2	44	22	56.2 - 41
	17	108 55.2	106 00.7	27.2	40 03.5	53.8	354 38.3	04.5	241 51.1	59.9	15 05.6	45	22	52.1 - 42
	18	123 57.6	121 00.4 - 0	26.1	55 04.2 +22	54.0	9 40.5 +22	04.5	256 53.7 -14	59.8	29 29.1	46	+22	47.9 - 44
	19	139 00.1	136 00.1	24.9	70 04.9	54.3	24 42.6	04.4	271 56.4	59.8	43 52.7	47	22	43.5 - 46
	20	154 02.6	150 59.8	23.8	85 05.5	54.6	39 44.8	04.4	286 59.0	59.7	58 16.4	48	22	38.9 - 47
	21	169 05.0	165 59.5 ..	22.6	100 06.2 ..	54.8	54 46.9 ..	04.3	302 01.6 ..	59.7	72 40.2	48	22	34.2 - 48
	22	184 07.5	180 59.1	21.5	115 06.9	55.1	69 49.1	04.3	317 04.3	59.6	87 04.0	50	22	29.4 - 50
	23	199 09.9	195 58.8	20.3	130 07.5	55.3	84 51.2	04.3	332 06.9	59.6	101 28.0	50	22	24.4 - 52
	27	0	214 12.4	210 58.5 - 0	19.2	145 08.2 +22	55.6	99 53.4 +22	04.2	347 09.6 -14	59.5	115 52.0	51	+22
1		229 14.9	225 58.2	18.1	160 08.9	55.8	114 55.5	04.2	2 12.2	59.5	130 16.1	52	22	13.9 - 54
2		244 17.3	240 57.9	16.9	175 09.5	56.1	129 57.7	04.1	17 14.9	59.4	144 40.3	53	22	08.5 - 56
3		259 19.8	255 57.6 ..	15.8	190 10.2 ..	56.3	144 59.9 ..	04.1	32 17.5 ..	59.4	159 04.6	54	22	02.9 - 57
4		274 22.3	270 57.3	14.6	205 10.9	56.6	160 02.0	04.0	47 20.2	59.3	173 29.0	55	21	57.2 - 59
5		289 24.7	285 57.0	13.5	220 11.5	56.8	175 04.2	04.0	62 22.8	59.3	187 53.5	56	21	51.3 - 60
6		304 27.2	300 56.7 - 0	12.3	235 12.2 +22	57.1	190 06.3 +22	03.9	77 25.4 -14	59.2	202 18.1	56	+21	45.3 - 61
7		319 29.7	315 56.4	11.2	250 12.9	57.3	205 08.5	03.9	92 28.1	59.2	216 42.7	58	21	39.2 - 63
8		334 32.1	330 56.1	10.0	265 13.6	57.6	220 10.6	03.8	107 30.7	59.1	231 07.5	58	21	32.9 - 64
9		349 34.6	345 55.8 ..	08.9	280 14.2 ..	57.8	235 12.7 ..	03.8	122 33.4 ..	59.1	245 32.3	60	21	26.5 - 65
10		4 37.1	0 55.4	07.7	295 14.9	58.1	250 14.9	03.7	137 36.0	59.0	259 57.3	60	21	20.0 - 67
11		19 39.5	15 55.1	06.6	310 15.6	58.3	265 17.0	03.7	152 38.7	59.0	274 22.3	62	21	13.3 - 68
12		34 42.0	30 54.8 - 0	05.5	325 16.2 +22	58.6	280 19.2 +22	03.6	167 41.3 -14	58.9	288 47.5	62	+21	06.5 - 70
13		49 44.4	45 54.5	04.3	340 16.9	58.8	295 21.3	03.6	182 44.0	58.9	303 12.7	64	20	59.5 - 70
14		64 46.9	60 54.2	03.2	355 17.6	59.1	310 23.5	03.5	197 46.6	58.8	317 38.1	64	20	52.5 - 72
15		79 49.4	75 53.9 ..	02.0	10 18.2 ..	59.3	325 25.6 ..	03.5	212 49.2 ..	58.8	332 03.5	65	20	45.3 - 73
16		94 51.8	90 53.6 - 0	00.9	25 18.9	59.6	340 27.8	03.4	227 51.9	58.7	346 29.0	67	20	38.0 - 74
17		109 54.3	105 53.3 + 0	00.3	40 19.6 22	59.8	355 29.9	03.4	242 54.5	58.7	0 54.7	67	20	30.6 - 76
18		124 56.8	120 53.0 + 0	01.4	55 20.3 +23	00.1	10 32.1 +22	03.3	257 57.2 -14	58.6	15 20.4	69	+20	23.0 - 77
19		139 59.2	135 52.7	02.6	70 20.9	00.3	25 34.2	03.3	272 59.8	58.6	29 46.3	69	20	15.3 - 77
20		155 01.7	150 52.4	03.7	85 21.6	00.6	40 36.4	03.2	288 02.5	58.5	44 12.2	71	20	07.6 - 79
21		170 04.2	165 52.1 ..	04.9	100 22.3 ..	00.8	55 38.5 ..	03.2	303 05.1 ..	58.5	58 38.3	71	19	59.7 - 81
22		185 06.6	180 51.7	06.0	115 22.9	01.1	70 40.7	03.1	318 07.8	58.4	73 04.4	73	19	51.6 - 81
23		200 09.1	195 51.4	07.1	130 23.6	01.3	85 42.8	03.1	333 10.4	58.4	87 30.7	73	1	

G M T	SUN		STARS			Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.	No.	Name	SHA				Dec.									
										25	26	27	28	Alt.	Sun's Low'r Limb	Venus	Mars	
h	°	'	°	'	°	'	h	m	h	m	h	m	h	m	°	'	'	'
25	0	180 27.8	+12 51.8	7	Acamar	315 51.7	-40 29.0	72	2 35	////	□	□	□	□	Alt.	Sun's Low'r Limb	Venus	Mars
	1	195 27.9	52.6	5	Achernar	335 59.6	-57 27.7	70	3 03	////	□	□	□	7 03	0	0	0	0
	2	210 28.0	53.5	30	Acrux	173 57.6	-62 51.4	68	3 24	////	□	□	5 09	7 50	30	0.2	0.1	0.1
	3	225 28.1	54.3	19	Adhara	255 46.9	-28 54.9	66	3 40	////	3 21	4 24	6 21	8 20	45	0.2	0.1	0.1
	4	240 28.2	55.1	10	Aldebaran	291 39.7	+16 25.2	64	3 53	////	4 18	5 23	6 58	8 42	60	0.2	0.1	0.0
	5	255 28.3	55.9					62	4 04	////	4 51	5 56	7 24	9 00	75	0.2	0.0	0.0
	6	270 28.5	+12 56.7	32	Alioth	166 58.2	+56 12.1	60	4 14	////	5 16	6 21	7 44	9 15	90	0.2	0.0	0.0
	7	285 28.6	57.6	34	Alkaid	153 32.6	+49 32.0	58	4 22	0 51	5 36	6 40	8 00	9 27				
	8	300 28.7	58.4	55	Al Na'ir	28 38.5	-47 10.5	56	4 29	1 35	5 52	6 57	8 15	9 38				
	9	315 28.8	+12 59.2	15	Alnilam	276 30.8	-1 13.8	54	4 36	2 01	6 06	7 11	8 27	9 48				
	10	330 28.9	13 00.0	25	Alphard	218 38.8	-8 28.1	52	4 42	2 21	6 18	7 23	8 37	9 56				
	11	345 29.0	00.8					50	4 47	2 37	6 29	7 34	8 47	10 04	Moon's Lower Limb			
	12	0 29.1	+13 01.7	41	Alphecca	126 47.5	+26 51.6	45	4 58	3 07	6 52	7 56	9 07	10 20	Add			
	13	15 29.2	02.5	1	Alpheratz	358 29.0	+28 50.6	40	5 08	3 28	7 10	8 14	9 23	10 33	Alt.	25	26	27
	14	30 29.3	03.3	51	Altair	62 50.7	+8 44.8	35	5 16	3 45	7 25	8 29	9 37	10 44	0	0	0	0
	15	45 29.5	04.1	2	Ankaa	353 58.9	-42 32.8	30	5 23	3 59	7 39	8 42	9 48	10 54	4	20.1	19.4	18.5
	16	60 29.6	04.9	42	Antares	113 19.4	-26 20.1	20	5 34	4 18	8 01	9 05	10 09	11 10	8	20.1	19.4	18.5
	17	75 29.7	05.8					10	5 45	4 33	8 21	9 24	10 26	11 25	12	20.1	19.3	18.4
	18	90 29.8	+13 06.6	37	Arcturus	146 35.1	+19 24.7	0	5 55	4 44	8 40	9 42	10 43	11 38	16	20.0	19.3	18.4
	19	105 29.9	07.4	43	Atria	109 00.0	-68 56.8	10	6 04	4 53	8 58	10 01	10 59	11 52	20	19.9	19.2	18.3
	20	120 30.0	08.2	22	Avior	234 36.0	-59 22.3	20	6 14	5 00	9 18	10 20	11 16	12 06	24	19.8	19.1	18.2
	21	135 30.1	09.0	13	Bellatrix	279 19.0	+6 18.6	30	6 25	5 04	9 41	10 43	11 36	12 23	28	19.7	19.0	18.2
	22	150 30.2	09.8	16	Betelg'se	271 48.7	+7 24.0	35	6 32	5 06	9 55	10 56	11 48	12 32	32	19.5	18.9	18.1
	23	165 30.3	10.7					40	6 39	5 07	10 10	11 11	12 01	12 43	36	19.4	18.7	18.0
				17	Canopus	264 15.8	-52 40.5	45	6 48	5 07	10 29	11 29	12 17	12 56	40	19.2	18.6	17.9
26	0	180 30.4	+13 11.5	12	Capella	281 39.2	+45 57.4	50	6 58	5 07	10 52	11 51	12 37	13 11	48	19.0	18.5	17.8
	1	195 30.5	12.3	53	Deneb	50 01.2	+45 07.0	52	7 03	5 07	11 03	12 02	12 46	13 18	52	18.8	18.3	17.7
	2	210 30.7	13.1	28	Denebola	183 17.8	+14 49.2	54	7 08	5 07	11 16	12 14	12 56	13 26	56	18.6	18.1	17.5
	3	225 30.8	13.9	4	Diphda	349 39.9	-18 13.8	56	7 14	5 07	11 31	12 28	13 07	13 35	60	18.4	18.0	17.4
	4	240 30.9	14.7					58	7 20	5 05	11 48	12 44	13 21	13 45	64	18.2	17.8	17.3
	5	255 31.0	15.5	27	Dubhe	194 44.5	+61 59.6	60	7 27	5 04	12 08	13 03	13 36	13 57	68	18.0	17.6	17.1
	6	270 31.1	+13 16.4	14	Elnath	279 08.0	+28 34.3	S							72	17.8	17.4	17.0
	7	285 31.2	17.2	47	Eltanin	91 06.1	+51 29.3	Lat.	Sunset	Twlt. ends	Moonset				76	17.5	17.2	16.8
	8	300 31.3	18.0	54	Enif	34 30.0	+9 40.1	N	h m	h m	h m	h m	h m	h m	80	17.3	17.0	16.7
	9	315 31.4	18.8	56	Fomalhaut	16 12.2	-29 51.4		h m	h m	h m	h m	h m	h m	84	17.0	16.8	16.5
	10	330 31.5	19.6						h m	h m	h m	h m	h m	h m	88	16.8	16.6	16.3
	11	345 31.6	20.4	31	Gacrux	172 49.1	-56 52.1	72	21 26	////	□	□	□	□	90	16.6	16.4	16.2
	12	0 31.7	+13 21.2	29	Gienah	176 36.9	-17 17.9	70	20 57	////	□	□	□	4 01	Add to table, back cover			
	13	15 31.8	22.0	35	Hadar	149 49.3	-60 09.7	68	20 35	////	□	□	3 54	3 13	Moon's Upper Limb			
	14	30 31.9	22.8	6	Hamal	328 50.4	+23 15.1	66	20 18	////	1 21	2 32	2 42	2 42	Subtract			
	15	45 32.0	23.6	48	Kaus Aust.	84 41.4	-34 24.4	64	20 05	////	0 25	1 33	2 05	2 18	Alt.	25	26	27
	16	60 32.1	24.5					62	19 53	////	24 59	0 59	1 38	2 00	0	12.9	13.4	13.9
	17	75 32.2	25.3	40	Kochab	137 16.6	+74 20.2	60	19 44	////	24 34	0 34	1 18	1 44	4	13.0	13.4	13.9
	18	90 32.4	+13 26.1	57	Markab	14 22.0	+14 57.8	58	19 35	23 18	24 14	0 14	1 01	1 31	8	13.0	13.4	13.9
	19	105 32.5	26.9	8	Menkar	315 01.0	+3 54.9	56	19 28	22 29	23 58	24 46	0 46	1 20	12	13.0	13.5	13.9
	20	120 32.6	27.7	36	Menkent	148 58.7	-36 09.3	54	19 21	22 00	23 44	24 34	0 34	1 10	16	13.1	13.5	14.0
	21	135 32.7	28.5	24	Miap'dus	221 49.0	-69 32.4	52	19 15	21 39	23 31	24 23	0 23	1 01	20	13.2	13.6	14.0
	22	150 32.8	29.3					50	19 10	21 23	23 21	24 13	0 13	0 53	24	13.3	13.7	14.1
	23	165 32.9	30.1	9	Mirfak	309 43.3	+49 42.3	45	18 58	20 52	22 58	23 52	24 36	0 36	28	13.4	13.8	14.2
				50	Nunki	76 52.1	-26 21.2	40	18 49	20 30	22 40	23 35	24 22	0 22	32	13.5	13.9	14.3
27	0	180 33.0	+13 30.9	52	Peacock	54 27.7	-56 52.5	35	18 41	20 13	22 24	23 21	24 09	0 09	36	13.7	14.0	14.4
	1	195 33.1	31.7	21	Pollux	244 21.0	+28 08.2	30	18 34	20 00	22 11	23 09	23 59	24 42	40	13.9	14.1	14.5
	2	210 33.2	32.5	20	Procyon	245 45.4	+5 20.3	20	18 21	19 38	21 48	22 47	23 41	24 28	44	14.0	14.3	14.6
	3	225 33.3	33.3					10	18 11	19 23	21 28	22 29	23 25	24 15	48	14.2	14.4	14.7
	4	240 33.4	34.1	46	R'alhague	96 46.7	+12 35.3	0	18 01	19 12	21 10	22 12	23 10	24 04	52	14.4	14.6	14.8
	5	255 33.5	34.9	26	Regulus	208 29.7	+12 11.0	10	17 52	19 03	20 51	21 54	22 55	23 52	56	14.6	14.8	15.0
	6	270 33.6	+13 35.7	11	Rigel	281 54.2	-8 15.2	20	17 42	18 56	20 31	21 35	22 38	23 39	60	14.8	15.0	15.1
	7	285 33.7	36.5	38	Rigil Kent.	140 50.8	-60 39.3	30	17 30	18 51	20 08	21 14	22 20	23 24	64	15.1	15.1	15.2
	8	300 33.8	37.3	44	Sabik	103 02.3	-15 40.4	35	17 24	18 49	19 55	21 01	22 09	23 16	68	15.3	15.3	15.4
	9	315 33.9	38.1					40	17 16	18 47	19 39	20 46	21 56	23 06	72	15.5	15.5	15.5
	10	330 34.0	38.9	3	Schedar	350 30.9	+56 17.5	45	17 08	18 47	19 20	20 29	21 41	22 54	76	15.7	15.7	15.7
	11	345 34.1	39.7	45	Shaula	97 20.8	-37 04.4	50	16 57	18 46	18 57	20 07	21 23	22 40	80	16.0	15.9	15.9
	12	0 34.2	+13 40.5	18	Sirius	259 12.3	-16 39.4	52	16 52	18 46	18 46	19 56	21 14	22 33	84	16.3	16.2	16.0
	13	15 34.3	41.3	33	Spica	159 16.9	-10 55.9	54	16 47	18 46	18 33	19 45	21 04	22 26	88	16.5	16.3	16.1

G M T	↑ GHA	VENUS -3.4			MARS 1.8			JUPITER -1.6			SATURN 0.3			MOON			
		GHA	Dec.		GHA	Dec.		GHA	Dec.		GHA	Dec.		GHA	code	Dec.	code
h	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
28 0	215 11.6	210 51.1	+ 0 08.3		145 24.3	+23 01.5		100 45.0	+22 03.0		348 13.0	-14 58.3		101 57.0	75	+19 35.3	-84
1	230 14.0	225 50.8	09.4		160 24.9	01.8		115 47.1	03.0		3 15.7	58.3		116 23.5	75	19 26.9	-85
2	245 16.5	240 50.5	10.6		175 25.6	02.0		130 49.3	03.0		18 18.3	58.2		130 50.0	77	19 18.4	-85
3	260 18.9	255 50.2	11.7		190 26.3	02.3		145 51.4	02.9		33 21.0	58.2		145 16.7	77	19 09.9	-87
4	275 21.4	270 49.9	12.9		205 26.9	02.5		160 53.5	02.9		48 23.6	58.1		159 43.4	79	19 01.2	-88
5	290 23.9	285 49.6	14.0		220 27.6	02.8		175 55.7	02.8		63 26.3	58.1		174 10.3	80	18 52.4	-89
6	305 26.3	300 49.3	+ 0 15.2		235 28.3	+23 03.0		190 57.8	+22 02.8		78 28.9	-14 58.0		188 37.3	80	+18 43.5	-89
7	320 28.8	315 49.0	16.3		250 28.9	03.2		206 00.0	02.7		93 31.6	58.0		203 04.3	82	18 34.6	-91
8	335 31.3	330 48.7	17.5		265 29.6	03.5		221 02.1	02.7		108 34.2	57.9		217 31.5	83	18 25.5	-92
9	350 33.7	345 48.4	18.6		280 30.3	03.7		236 04.3	02.6		123 36.9	57.9		231 58.8	84	-18 16.3	-93
10	5 36.2	0 48.0	19.8		295 30.9	04.0		251 06.4	02.6		138 39.5	57.8		246 26.2	84	18 07.0	-94
11	20 38.7	15 47.7	20.9		310 31.6	04.2		266 08.5	02.5		153 42.1	57.8		260 53.6	86	17 57.6	-94
12	35 41.1	30 47.4	+ 0 22.1		325 32.3	+23 04.5		281 10.7	+22 02.5		168 44.8	-14 57.7		275 21.2	87	+17 48.2	-96
13	50 43.6	45 47.1	23.2		340 33.0	04.7		296 12.8	02.4		183 47.4	57.7		289 48.9	88	17 38.6	-96
14	65 46.0	60 46.8	24.4		355 33.6	04.9		311 15.0	02.4		198 50.1	57.6		304 16.7	89	17 29.0	-98
15	80 48.5	75 46.5	25.5		10 34.3	05.2		326 17.1	02.3		213 52.7	57.6		318 44.6	89	-17 19.2	-98
16	95 51.0	90 46.2	26.6		25 35.0	05.4		341 19.3	02.3		228 55.4	57.5		333 12.5	91	17 09.4	-99
17	110 53.4	105 45.9	27.8		40 35.6	05.7		356 21.4	02.2		243 58.0	57.5		347 40.6	92	16 59.5	-100
18	125 55.9	120 45.6	+ 0 28.9		55 36.3	+23 05.9		11 23.5	+22 02.2		259 00.7	-14 57.4		2 08.8	93	+16 49.5	-101
19	140 58.4	135 45.3	30.1		70 37.0	06.1		26 25.7	02.1		274 03.3	57.4		16 37.1	94	16 39.4	-102
20	156 00.8	150 45.0	31.2		85 37.6	06.4		41 27.8	02.1		289 06.0	57.3		31 05.5	94	16 29.2	-102
21	171 03.3	165 44.7	32.4		100 38.3	06.6		56 30.0	02.0		304 08.6	57.3		45 33.9	96	-16 19.0	-103
22	186 05.8	180 44.3	33.5		115 39.0	06.8		71 32.1	02.0		319 11.2	57.2		60 02.5	97	16 08.7	-104
23	201 08.2	195 44.0	34.7		130 39.6	07.1		86 34.2	01.9		334 13.9	57.1		74 31.2	97	15 58.3	-105
29 0	216 10.7	210 43.7	+ 0 35.8		145 40.3	+23 07.3		101 36.4	+22 01.9		349 16.5	-14 57.1		88 59.9	99	+15 47.8	-105
1	231 13.2	225 43.4	37.0		160 41.0	07.6		116 38.5	01.8		4 19.2	57.0		103 28.8	100	15 37.3	-107
2	246 15.6	240 43.1	38.1		175 41.6	07.8		131 40.7	01.8		19 21.8	57.0		117 57.8	100	15 26.6	-107
3	261 18.1	255 42.8	39.3		190 42.3	08.0		146 42.8	01.7		34 24.5	56.9		132 26.8	102	+15 15.9	-107
4	276 20.5	270 42.5	40.4		205 43.0	08.3		161 44.9	01.7		49 27.1	56.9		146 56.0	102	15 05.2	-109
5	291 23.0	285 42.2	41.6		220 43.6	08.5		176 47.1	01.6		64 29.8	56.8		161 25.2	103	14 54.3	-109
6	306 25.5	300 41.9	+ 0 42.7		235 44.3	+23 08.7		191 49.2	+22 01.6		79 32.4	-14 56.8		175 54.5	105	+14 43.4	-109
7	321 27.9	315 41.6	43.9		250 45.0	09.0		206 51.4	01.5		94 35.1	56.7		190 24.0	105	14 32.5	-111
8	336 30.4	330 41.3	45.0		265 45.6	09.2		221 53.5	01.5		109 37.7	56.7		204 53.5	106	14 21.4	-111
9	351 32.9	345 40.9	46.2		280 46.3	09.4		236 55.6	01.4		124 40.4	56.6		219 23.1	107	+14 10.3	-111
10	6 35.3	0 40.6	47.3		295 47.0	09.7		251 57.8	01.4		139 43.0	56.6		233 52.8	107	13 59.2	-112
11	21 37.8	15 40.3	48.5		310 47.6	09.9		266 59.9	01.3		154 45.6	56.5		248 22.5	109	13 48.0	-113
12	36 40.3	30 40.0	+ 0 49.6		325 48.3	+23 10.1		282 02.0	+22 01.3		169 48.3	-14 56.5		262 52.4	110	+13 36.7	-113
13	51 42.7	45 39.7	50.8		340 49.0	10.4		297 04.2	01.2		184 50.9	56.4		277 22.4	110	13 25.4	-114
14	66 45.2	60 39.4	51.9		355 49.6	10.6		312 06.3	01.2		199 53.6	56.4		291 52.4	111	13 14.0	-115
15	81 47.7	75 39.1	53.1		10 50.3	10.8		327 08.4	01.1		214 56.2	56.3		306 22.5	113	+13 02.5	-115
16	96 50.1	90 38.8	54.2		25 51.0	11.1		342 10.6	01.1		229 58.9	56.3		320 52.8	112	12 51.0	-116
17	111 52.6	105 38.5	55.3		40 51.6	11.3		357 12.7	01.0		245 01.5	56.2		335 23.0	114	12 39.4	-116
18	126 55.0	120 38.2	+ 0 56.5		55 52.3	+23 11.5		12 14.9	+22 01.0		260 04.2	-14 56.2		349 53.4	115	+12 27.8	-116
19	141 57.5	135 37.9	57.6		70 53.0	11.7		27 17.0	00.9		275 06.8	56.1		4 23.9	115	12 16.2	-117
20	157 00.0	150 37.6	58.8		85 53.6	12.0		42 19.1	00.9		290 09.5	56.1		18 54.4	116	12 04.5	-118
21	172 02.4	165 37.2	+ 0 59.9		100 54.3	12.2		57 21.3	00.8		305 12.1	56.0		33 25.0	117	+11 52.7	-118
22	187 04.9	180 36.9	1 01.1		115 55.0	12.4		72 23.4	00.8		320 14.8	56.0		47 55.7	118	11 40.9	-118
23	202 07.4	195 36.6	02.2		130 55.6	12.7		87 25.5	00.7		335 17.4	55.9		62 26.5	119	11 29.1	-119
30 0	217 09.8	210 36.3	+ 1 03.4		145 56.3	+23 12.9		102 27.7	+22 00.7		350 20.1	-14 55.9		76 57.4	119	+11 17.2	-120
1	232 12.3	225 36.0	04.5		160 57.0	13.1		117 29.8	00.6		5 22.7	55.8		91 28.3	120	11 05.2	-120
2	247 14.8	240 35.7	05.7		175 57.6	13.4		132 31.9	00.6		20 25.4	55.8		105 59.3	121	10 53.2	-120
3	262 17.2	255 35.4	06.8		190 58.3	13.6		147 34.1	00.5		35 28.0	55.7		120 30.4	122	+10 41.2	-120
4	277 19.7	270 35.1	08.0		205 59.0	13.8		162 36.2	00.4		50 30.6	55.7		135 01.6	122	10 29.2	-121
5	292 22.2	285 34.8	09.1		220 59.6	14.0		177 38.3	00.4		65 33.3	55.6		149 32.8	123	10 17.1	-122
6	307 24.6	300 34.5	+ 1 10.3		236 00.3	+23 14.3		192 40.5	+22 00.3		80 35.9	-14 55.6		164 04.1	124	+10 04.9	-121
7	322 27.1	315 34.2	11.4		251 01.0	14.5		207 42.6	00.3		95 38.6	55.5		178 35.5	124	9 52.8	-122
8	337 29.5	330 33.8	12.6		266 01.6	14.7		222 44.7	00.2		110 41.2	55.5		193 06.9	125	9 40.6	-123
9	352 32.0	345 33.5	13.7		281 02.3	14.9		237 46.9	00.2		125 43.9	55.4		207 38.4	126	9 28.3	-123
10	7 34.5	0 33.2	14.9		296 03.0	15.2		252 49.0	00.1		140 46.5	55.4		222 10.0	126	9 16.0	-123
11	22 36.9	15 32.9	16.0		311 03.6	15.4		267 51.1	00.1		155 49.2	55.3		236 41.6	127	9 03.7	-123
12	37 39.4	30 32.6	+ 1 17.2		326 04.3	+23 15.6		282 53.2	+22 00.0		170 51.8	-14 55.3		251 13.3	128	+ 8 51.4	-124
13	52 41.9	45 32.3	18.3		341 05.0	15.8		297 55.4	22 00.0		185 54.5	55.2		265 45.1	128	8 39.0	-124
14	67 44.3	60 32.0	19.5		356 05.6	16.1		312 57.5	21 59.9		200 57.1	55.2		280 16.9	129	8 26.6	-124
15	82 46.8	75 31.7	20.6		11 06.3	16.3		327 59.6	21 59.9		215 59.8	55.1		294 48.8	130	8 14.2	-124
16	97 49.3	90 31.4	21.8		26 07.0	16.5		343 01.8	59.8		231 02.4	55.1		309 20.8	130	8 01.8	-125
17	112 51.7	105 31.1	22.9		41 07.6	16.7		358 03.9	59.8		246 05.1	55.0		323 52.8	131	7 49.3	-125
18	127 54.2	120 30.7	+ 1 24.1		56 08.3	+23 17.0		13 06.0	+21 59.7		261 07.7	-14 55.0		338 24.9	131	+ 7 36.8	-125
19	142 56.6	135 30.4	25.2		71 09.0	17.2		28 08.2	59.7		276 10.4	54.9		352 57.0	132	7 24.3	-126
20	157 59.1	150 30.1	26.4		86 09.6	17.4		43 10.3	59.6		291 13.0	54.9		7 29.2	133	7 11.7	-125
21	173 01.6	165 29.8	27.5														

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS			
	GHA	Dec.	No.	Name	SHA	Dec.				28	29	30	1	Alt.	Sun's Low'r Limb Add	Venus Add	Mars Add
28 0	180 35.4	+13 50.1	7	Acamar	315 51.7	-40 29.0	72	2 14	///	☐	9 01	11 19	13 19	Alt.			
1	195 35.5	50.9	5	Achernar	335 59.6	-57 27.7	70	2 47	///	7 03	9 31	11 33	13 24				
2	210 35.6	51.7	30	Acrux	173 57.6	-62 51.4	68	3 10	///	7 50	9 53	11 45	13 28				
3	225 35.7	52.5	19	Adhara	255 46.9	-28 54.9	66	3 28	///	8 20	10 11	11 54	13 32				
4	240 35.8	53.3	10	Aldebaran	291 39.7	+16 25.2	64	3 43	///	8 42	10 25	12 02	13 34				
5	255 35.9	54.1					62	3 55	///	9 00	10 36	12 09	13 37				
6	270 36.0	+13 54.9	32	Alioth	166 58.2	+56 12.1	60	4 06	///	9 15	10 46	12 14	13 39				
7	285 36.1	55.7	34	Alkaid	153 32.6	+49 32.0	58	4 15	///	9 27	10 55	12 19	13 41				
8	300 36.2	56.5	55	Al Na'ir	28 38.5	-47 10.5	56	4 22	1 16	9 38	11 02	12 24	13 43				
9	315 36.3	57.3	15	Anilam	276 30.8	-1 13.8	54	4 29	1 48	9 48	11 09	12 28	13 44				
10	330 36.4	58.1	25	Alphard	218 38.8	-8 28.1	52	4 36	2 10	9 56	11 15	12 32	13 46				
11	345 36.5	58.9					50	4 41	2 27	10 04	11 20	12 35	13 47				
12	0 36.6	+13 59.7	41	Alphecca	126 47.5	+26 51.7	45	4 54	3 00	10 20	11 32	12 42	13 49				
13	15 36.7	14 00.4	1	Alpheratz	358 28.9	+28 50.5	40	5 04	3 23	10 33	11 42	12 48	13 52				
14	30 36.8	01.2	51	Altair	62 50.6	+8 44.8	35	5 12	3 40	10 44	11 50	12 53	13 54				
15	45 36.8	02.0	2	Ankaa	353 58.9	-42 32.8	30	5 20	3 55	10 54	11 57	12 57	13 55				
16	60 36.9	02.8	42	Antares	113 19.4	-26 20.1	20	5 33	4 16	11 10	12 09	13 05	13 58				
17	75 37.0	03.6					10	5 44	4 31	11 25	12 20	13 12	14 01				
18	90 37.1	+14 04.4	37	Arcturus	146 35.1	+19 24.7	0	5 54	4 43	11 38	12 30	13 18	14 03				
19	105 37.2	05.2	43	Atria	109 00.0	-68 56.8	10	6 04	4 53	11 52	12 40	13 24	14 06				
20	120 37.3	06.0	22	Avior	234 36.0	-59 22.3	20	6 15	5 00	12 06	12 51	13 31	14 09				
21	135 37.4	06.8	13	Bellatrix	279 19.0	+6 18.6	30	6 27	5 06	12 23	13 03	13 39	14 12				
22	150 37.5	07.5	16	Betelge'se	271 48.7	+7 24.0	35	6 34	5 08	12 32	13 10	13 43	14 13				
23	165 37.6	08.3					40	6 42	5 10	12 43	13 18	13 48	14 15				
29 0	180 37.7	+14 09.1	17	Canopus	264 15.8	-52 40.5	45	6 51	5 11	12 56	13 27	13 54	14 17				
1	195 37.8	09.9	12	Capella	281 39.2	+45 57.4	50	7 03	5 12	13 11	13 38	14 00	14 20				
2	210 37.9	10.7	53	Deneb	50 01.2	+45 07.0	52	7 08	5 12	13 18	13 43	14 04	14 21				
3	225 38.0	11.5	28	Denebola	183 17.8	+14 49.2	54	7 13	5 12	13 26	13 49	14 07	14 23				
4	240 38.1	12.3	4	Diphda	349 39.8	-18 13.8	56	7 20	5 12	13 35	13 55	14 11	14 24				
5	255 38.2	13.0					58	7 27	5 11	13 45	14 02	14 15	14 26				
6	270 38.3	+14 13.8	27	Dubhe	194 44.5	+61 59.6	60	7 35	5 10	13 57	14 10	14 20	14 28				
7	285 38.3	14.6	41	Elnath	279 08.0	+28 34.3											
8	300 38.4	15.4	47	Eltanin	91 06.0	+51 29.4											
9	315 38.5	16.2	54	Enif	34 30.0	+9 40.1											
10	330 38.6	17.0	56	Fomalhaut	16 12.1	-29 51.4											
11	345 38.7	17.7															
12	0 38.8	+14 18.5	31	Gacrux	172 49.1	-56 52.1	72	21 47	///	☐	3 53	3 18	2 53				
13	15 38.9	19.3	29	Gienah	176 36.9	-17 17.9	70	21 12	///	4 01	3 22	3 01	2 46				
14	30 39.0	20.1	35	Hadar	149 49.3	-60 09.7	68	20 48	///	3 13	2 58	2 48	2 39				
15	45 39.1	20.9	6	Hamal	328 50.3	+23 15.1	66	20 29	///	2 42	2 40	2 37	2 34				
16	60 39.2	21.6	48	Kaus Aust.	84 41.3	-34 24.4	64	20 14	///	2 18	2 25	2 28	2 29				
17	75 39.3	22.4					62	20 02	///	2 00	2 12	2 20	2 25				
18	90 39.3	+14 23.2	40	Kochab	137 16.6	+74 20.2	60	19 51	///	1 44	2 01	2 13	2 22				
19	105 39.4	24.0	57	Markab	14 22.0	+14 57.8	58	19 42	///	1 31	1 52	2 07	2 19				
20	120 39.5	24.8	8	Menkar	315 01.0	+3 54.9	56	19 34	22 48	1 20	1 44	2 01	2 16				
21	135 39.6	25.5	36	Menkent	148 58.7	-36 09.3	54	19 27	22 13	1 10	1 36	1 57	2 13				
22	150 39.7	26.3	24	Miap'l'dus	221 49.0	-69 32.4	52	19 20	21 49	1 01	1 29	1 52	2 11				
23	165 39.8	27.1					50	19 14	21 31	0 53	1 23	1 48	2 09				
30 0	180 39.9	+14 27.9	9	Mirfak	309 43.3	+49 42.3	45	19 02	20 58	0 36	1 10	1 39	2 04				
1	195 40.0	28.7	50	Nunki	76 52.1	-26 21.2	40	18 52	20 35	0 22	1 00	1 32	2 01				
2	210 40.0	29.4	52	Peacock	54 27.7	-56 52.5	35	18 43	20 16	0 09	0 50	1 26	1 57				
3	225 40.1	30.2	21	Pollux	244 21.0	+28 08.2	30	18 36	20 02	24 42	0 42	1 20	1 54				
4	240 40.2	31.0	20	Procyon	245 45.4	+5 20.3	20	18 23	19 41	24 28	0 28	1 10	1 49				
5	255 40.3	31.8					10	18 11	19 24	24 15	0 15	1 02	1 44				
6	270 40.4	+14 32.5	46	R'alhague	96 46.6	+12 35.3	0	18 01	19 12	24 04	0 04	0 53	1 40				
7	285 40.5	33.3	26	Regulus	208 29.7	+12 11.0	10	17 50	19 02	23 52	24 45	0 45	1 36				
8	300 40.6	34.1	11	Rigel	281 54.2	-8 15.2	20	17 40	18 55	23 39	24 36	0 36	1 31				
9	315 40.7	34.8	38	Rigel Kent.	140 50.8	-60 39.3	30	17 27	18 48	23 24	24 26	0 26	1 25				
10	330 40.7	35.6	44	Sabik	103 02.3	-15 40.4	35	17 20	18 46	23 16	24 20	0 20	1 22				
11	345 40.8	36.4					40	17 12	18 44	23 06	24 13	0 13	1 19				
12	0 40.9	+14 37.2	3	Schedar	350 30.9	+56 17.5	45	17 03	18 42	22 54	24 06	0 06	1 15				
13	15 41.0	37.9	45	Shaula	97 20.8	-37 04.4	50	16 52	18 41	22 40	23 56	25 10	1 10				
14	30 41.1	38.7	18	Sirius	259 12.3	-16 39.4	52	16 46	18 40	22 33	23 52	25 07	1 07				
15	45 41.2	39.5	33	Spica	159 16.9	-10 55.9	54	16 41	18 41	22 26	23 47	25 05	1 05				
16	60 41.3	40.2	23	Suhail	223 24.5	-43 15.5	56	16 34	18 41	22 18	23 41	25 02	1 02				
17	75 41.3	41.0					58	16 27	18 41	22 09	23 35	24 59	0 59				
18	90 41.4	+14 41.8	49	Vega	81 08.2	+38 44.2	60	16 19	18 41	21 58	23 28	24 55	0 55				
19	105 41.5	42.6	39	Zub'g'bi	137 53.4	-15 51.6											
20	120 41.6	43.3															
21	135 41.7	44.1															
22	150 41.8	44.9															
23	165 41.8	45.6															
24	180 41.9	+14 46.4															
code	-	+ 8															

Add to table,
back coverMoon's Upper Limb
Subtract

Alt. 28 29 30

0 14.5 15.0 15.6

8 14.5 15.0 15.6

12 14.5 15.0 15.6

16 14.5 15.0 15.6

20 14.6 15.0 15.6

24 14.6 15.0 15.6

28 14.7 15.1 15.6

32 14.7 15.1 15.6

36 14.8 15.1 15.6

40 14.8 15.2 15.6

44 14.9 15.2 15.6

48 15.0 15.3 15.6

52 15.1 15.3 15.6

56 15.2 15.3 15.6

60 15.3 15.4 15.6

64 15.3 15.4 15.6

68 15.4 15.5 15.6

72 15.5 15.5 15.6

76 15.6 15.6 15.6

80 15.8 15.7 15.6

84 15.9 15.7 15.6

88 15.9 15.8 15.6

90 15.9 15.8 15.6

Subtract from table,
back cover

First Quarter 29

G M T	VENUS -3.4		MARS 1.8		JUPITER -1.6		SATURN 0.3		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
h	°	'	°	'	°	'	°	'	°	'	°	'
10	218 09.0	210 28.9 + 1 31.0	146 12.3 +23 18.3	103 18.8 +21 59.4	351 23.6 -14 54.7	65 38.6 134 + 6 21.4 -127						
1	233 11.4	225 28.6 32.1	161 13.0 18.5	118 20.9 59.4	6 26.2 54.6	80 11.0 135 6 08.7 -126						
2	248 13.9	240 28.3 33.3	176 13.6 18.7	133 23.1 59.3	21 28.9 54.6	94 43.5 136 5 56.1 -127						
3	263 16.4	255 27.9 .. 34.4	191 14.3 .. 18.9	148 25.2 .. 59.3	36 31.5 .. 54.5	109 16.1 136 .. 5 43.4 -127						
4	278 18.8	270 27.6 35.6	206 15.0 19.2	163 27.3 59.2	51 34.2 54.5	123 48.7 137 5 30.7 -127						
5	293 21.3	285 27.3 36.7	221 15.6 19.4	178 29.4 59.2	66 36.8 54.4	138 21.4 137 5 18.0 -127						
6	308 23.8	300 27.0 + 1 37.9	236 16.3 +23 19.6	193 31.6 +21 59.1	81 39.5 -14 54.4	152 54.1 138 + 5 05.3 -127						
7	323 26.2	315 26.7 39.0	251 16.9 19.8	208 33.7 59.0	96 42.1 54.3	167 26.9 138 4 52.6 -127						
8	338 28.7	330 26.4 40.2	266 17.6 20.0	223 35.8 59.0	111 44.8 54.3	181 59.7 138 4 39.9 -128						
9	353 31.1	345 26.1 .. 41.3	281 18.3 .. 20.2	238 37.9 .. 58.9	126 47.4 .. 54.2	196 32.5 139 .. 4 27.1 -127						
10	8 33.6	0 25.8 42.5	296 18.9 20.5	253 40.1 58.9	141 50.1 54.2	211 05.4 139 4 14.4 -128						
11	23 36.1	15 25.5 43.6	311 19.6 20.7	268 42.2 58.8	156 52.7 54.1	225 38.3 140 4 01.6 -128						
12	38 38.5	30 25.2 + 1 44.8	326 20.3 +23 20.9	283 44.3 +21 58.8	171 55.4 -14 54.1	240 11.3 140 + 3 48.8 -127						
13	53 41.0	45 24.8 45.9	341 20.9 21.1	298 46.4 58.7	186 58.0 54.0	254 44.3 141 3 36.1 -128						
14	68 43.5	60 24.5 47.1	356 21.6 21.3	313 48.6 58.7	202 00.7 54.0	269 17.4 140 3 23.3 -128						
15	83 45.9	75 24.2 .. 48.2	11 22.3 .. 21.5	328 50.7 .. 58.6	217 03.3 .. 53.9	283 50.4 142 .. 3 10.5 -128						
16	98 48.4	90 23.9 49.4	26 22.9 21.8	343 52.8 58.6	232 06.0 53.9	298 23.6 141 2 57.7 -127						
17	113 50.9	105 23.6 50.5	41 23.6 22.0	358 54.9 58.5	247 08.6 53.8	312 56.7 142 2 45.0 -128						
18	128 53.3	120 23.3 + 1 51.7	56 24.3 +23 22.2	13 57.1 +21 58.5	262 11.3 -14 53.8	327 29.9 142 + 2 32.2 -128						
19	143 55.8	135 23.0 52.8	71 24.9 22.4	28 59.2 58.4	277 13.9 53.7	342 03.1 143 2 19.4 -128						
20	158 58.2	150 22.7 54.0	86 25.6 22.6	44 01.3 58.4	292 16.6 53.7	356 36.4 143 2 06.6 -128						
21	174 00.7	165 22.4 .. 55.1	101 26.3 .. 22.8	59 03.4 .. 58.3	307 19.2 .. 53.6	11 09.7 143 .. 1 53.8 -128						
22	189 03.2	180 22.0 56.3	116 26.9 23.0	74 05.6 58.3	322 21.9 53.6	25 43.0 144 1 41.0 -127						
23	204 05.6	195 21.7 57.4	131 27.6 23.2	89 07.7 58.2	337 24.5 53.5	40 16.4 144 1 28.3 -128						
2	219 08.1	210 21.4 + 1 58.6	146 28.3 +23 23.5	104 09.8 +21 58.1	352 27.2 -14 53.4	54 49.8 144 + 1 15.5 -128						
1	234 10.6	225 21.1 1 59.7	161 28.9 23.7	119 11.9 58.1	7 29.8 53.4	69 23.2 144 1 02.7 -127						
2	249 13.0	240 20.8 2 00.9	176 29.6 23.9	134 14.0 58.0	22 32.4 53.3	83 56.6 145 0 50.0 -128						
3	264 15.5	255 20.5 .. 02.0	191 30.2 .. 24.1	149 16.2 .. 58.0	37 35.1 .. 53.3	98 30.1 144 .. 0 37.2 -127						
4	279 18.0	270 20.2 03.2	206 30.9 24.3	164 18.3 57.9	52 37.7 53.2	113 03.5 146 0 24.5 -128						
5	294 20.4	285 19.9 04.3	221 31.6 24.5	179 20.4 57.9	67 40.4 53.2	127 37.1 145 + 0 11.7 -127						
6	309 22.9	300 19.5 + 2 05.5	236 32.2 +23 24.7	194 22.5 +21 57.8	82 43.0 -14 53.1	142 10.6 145 - 0 01.0 -127						
7	324 25.4	315 19.2 06.6	251 32.9 24.9	209 24.7 57.8	97 45.7 53.1	156 44.1 146 0 13.7 -127						
8	339 27.8	330 18.9 07.8	266 33.6 25.1	224 26.8 57.7	112 48.3 53.0	171 17.7 146 0 26.4 -127						
9	354 30.3	345 18.6 .. 08.9	281 34.2 .. 25.4	239 28.9 .. 57.7	127 51.0 .. 53.0	185 51.3 146 .. 0 39.1 -127						
10	9 32.7	0 18.3 10.1	296 34.9 25.6	254 31.0 57.6	142 53.6 52.9	200 24.9 147 0 51.8 -127						
11	24 35.2	15 18.0 11.2	311 35.6 25.8	269 33.1 57.6	157 56.3 52.9	214 58.6 146 1 04.5 -127						
12	39 37.7	30 17.7 + 2 12.4	326 36.2 +23 26.0	284 35.3 +21 57.5	172 58.9 -14 52.8	229 32.2 147 - 1 17.2 -126						
13	54 40.1	45 17.4 13.5	341 36.9 26.2	299 37.4 57.4	188 01.6 52.8	244 05.9 147 1 29.8 -126						
14	69 42.6	60 17.0 14.7	356 37.5 26.4	314 39.5 57.4	203 04.2 52.7	258 39.6 146 1 42.4 -126						
15	84 45.1	75 16.7 .. 15.8	11 38.2 .. 26.6	329 41.6 .. 57.3	218 06.9 .. 52.7	273 13.2 148 1 55.0 -126						
16	99 47.5	90 16.4 17.0	26 38.9 26.8	344 43.7 57.3	233 09.5 52.6	287 47.0 147 2 07.6 -126						
17	114 50.0	105 16.1 18.1	41 39.5 27.0	359 45.9 57.2	248 12.2 52.6	302 20.7 147 2 20.2 -126						
18	129 52.5	120 15.8 + 2 19.3	56 40.2 +23 27.2	14 48.0 +21 57.2	263 14.8 -14 52.5	316 54.4 147 - 2 32.8 -125						
19	144 54.9	135 15.5 20.4	71 40.9 27.4	29 50.1 57.1	278 17.5 52.5	331 28.1 148 2 45.3 -125						
20	159 57.4	150 15.2 21.6	86 41.5 27.6	44 52.2 57.1	293 20.1 52.4	346 01.9 148 2 57.8 -125						
21	174 59.9	165 14.9 .. 22.7	101 42.2 .. 27.8	59 54.3 .. 57.0	308 22.8 .. 52.4	0 35.7 147 .. 3 10.3 -125						
22	190 02.3	180 14.5 23.8	116 42.9 28.0	74 56.4 57.0	323 25.4 52.3	15 09.4 148 3 22.8 -125						
23	205 04.8	195 14.2 25.0	131 43.5 28.2	89 58.6 56.9	338 28.1 52.3	29 43.2 148 3 35.3 -124						
3	220 07.2	210 13.9 + 2 26.1	146 44.2 +23 28.4	105 00.7 +21 56.9	353 30.7 -14 52.2	44 17.0 148 - 3 47.7 -124						
1	235 09.7	225 13.6 27.3	161 44.9 28.6	120 02.8 56.8	8 33.4 52.2	58 50.8 148 4 00.1 -124						
2	250 12.2	240 13.3 28.4	176 45.5 28.8	135 04.9 56.7	23 36.0 52.1	73 24.6 148 4 12.5 -123						
3	265 14.6	255 13.0 .. 29.6	191 46.2 .. 29.1	150 07.0 .. 56.7	38 38.7 .. 52.1	87 58.4 148 .. 4 24.8 -124						
4	280 17.1	270 12.7 30.7	206 46.8 29.3	165 09.1 56.6	53 41.3 52.0	102 32.2 148 4 37.2 -123						
5	295 19.6	285 12.3 31.9	221 47.5 29.5	180 11.3 56.6	68 44.0 52.0	117 06.0 147 4 49.5 -122						
6	310 22.0	300 12.0 + 2 33.0	236 48.2 +23 29.7	195 13.4 +21 56.5	83 46.6 -14 51.9	131 39.7 149 - 5 01.7 -123						
7	325 24.5	315 11.7 34.2	251 48.8 29.9	210 15.5 56.5	98 49.3 51.9	146 13.6 147 5 14.0 -122						
8	340 27.0	330 11.4 35.3	266 49.5 30.1	225 17.6 56.4	113 51.9 51.8	160 47.3 148 5 26.2 -122						
9	355 29.4	345 11.1 .. 36.5	281 50.2 .. 30.3	240 19.7 .. 56.4	128 54.6 .. 51.8	175 21.1 148 .. 5 38.4 -121						
10	10 31.9	0 10.8 37.6	296 50.8 30.5	255 21.8 56.3	143 57.2 51.7	189 54.9 148 5 50.5 -121						
11	25 34.3	15 10.5 38.8	311 51.5 30.7	270 23.9 56.2	158 59.9 51.7	204 28.7 148 6 02.6 -121						
12	40 36.8	30 10.1 + 2 39.9	326 52.2 +23 30.9	285 26.1 +21 56.2	174 02.5 -14 51.6	219 02.5 148 - 6 14.7 -121						
13	55 39.3	45 09.8 41.1	341 52.8 31.1	300 28.2 56.1	189 05.2 51.6	233 36.3 148 6 26.8 -120						
14	70 41.7	60 09.5 42.2	356 53.5 31.3	315 30.3 56.1	204 07.8 51.5	248 10.1 148 6 38.8 -120						
15	85 44.2	75 09.2 .. 43.4	11 54.1 .. 31.5	330 32.4 .. 56.0	219 10.5 .. 51.5	262 43.9 147 .. 6 50.8 -119						
16	100 46.7	90 08.9 44.5	26 54.8 31.7	345 34.5 56.0	234 13.1 51.4	277 17.6 148 7 02.7 -119						
17	115 49.1	105 08.6 45.7	41 55.5 31.9	0 36.6 55.9	249 15.8 51.4	291 51.4 147 7 14.6 -119						
18	130 51.6	120 08.3 + 2 46.8	56 56.1 +23 32.1	15 38.7 +21 55.9	264 18.4 -14 51.3	306 25.1 148 - 7 26.5 -119						
19	145 54.1	135 07.9 48.0	71 56.8 32.2	30 40.8 55.8	279 21.1 51.3	320 58.9 147 7 38.4 -118						
20	160 56.5	150 07.6 49.1	86 57.5 32.4	45 43.0 55.8	294 23.7 51.2	335 32.6 147 7 50.2 -117						
21	175 59.0	165 07.3 .. 50.3	101 58.1 .. 32.6	60 45.1 .. 55.7	309 26.4 .. 51.2	350 06.3 147 .. 8 01.9 -117						
22	191 01.5	180 07.0 51.4	116 58.8 32.8	75 47.2 55.6	324 29.0 51.1	4 40.0 147 8 13.6 -117						
23	206 03.9	195 06.7 52.6	131 59.4 33.0	90 49.3 55.6	339 31.7 51.1	19 13.7 147 8 25.3 -117						
24	221 06.4	210 06.4 + 2 53.7	147 00.1 +23 33.2	105 51.4 +21 55.5	354 34.3 -14 51.0	33 47.4 147 - 8 37.0 -115						
code	-	- 3 + 11	+ 7 + 2	+ 21 - 1	+ 27 0							

G M T	VENUS -3.4		MARS 1.8		JUPITER -1.6		SATURN 0.3		MOON		
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.
4 0	221 06.4	210 06.4 + 2 53.7	147 00.1 +23 33.2	105 51.4 +21 55.5	354 34.3 -14 51.0	33 47.4 147 - 8 37.0 -115					
1	236 08.8	225 06.0 54.9	162 00.8 33.4	120 53.5 55.5	9 37.0 51.0	48 21.1 146 8 48.5 -116					
2	251 11.3	240 05.7 56.0	177 01.4 33.6	135 55.6 55.4	24 39.6 50.9	62 54.7 146 9 00.1 -115					
3	266 13.8	255 05.4 .. 57.2	192 02.1 .. 33.8	150 57.7 .. 55.4	39 42.3 .. 50.9	77 28.3 147 * 9 11.6 -115					
4	281 16.2	270 05.1 58.3	207 02.8 34.0	165 59.9 55.3	54 44.9 50.8	92 02.0 146 9 23.1 -114					
5	296 18.7	285 04.8 2 59.5	222 03.4 34.2	181 02.0 55.3	69 47.6 50.8	106 35.6 146 9 34.5 -114					
6	311 21.2	300 04.5 + 3 00.6	237 04.1 +23 34.4	196 04.1 +21 55.2	84 50.2 -14 50.7	121 09.2 145 - 9 45.9 -113					
7	326 23.6	315 04.2 01.8	252 04.8 34.6	211 06.2 55.1	99 52.9 50.7	135 42.7 146 9 57.2 -113					
8	341 26.1	330 03.8 02.9	267 05.4 34.8	226 08.3 55.1	114 55.5 50.6	150 16.3 145 10 08.5 -112					
9	356 28.6	345 03.5 .. 04.1	282 06.1 .. 35.0	241 10.4 .. 55.0	129 58.2 .. 50.5	164 49.8 145 *10 19.7 -112					
10	11 31.0	0 03.2 05.2	297 06.7 35.2	256 12.5 55.0	145 00.8 50.5	179 23.3 145 10 30.9 -111					
11	26 33.5	15 02.9 06.4	312 07.4 35.4	271 14.6 54.9	160 03.5 50.4	193 56.8 145 10 42.0 -111					
12	41 35.9	30 02.6 + 3 07.5	327 08.1 +23 35.5	286 16.7 +21 54.9	175 06.1 -14 50.4	208 30.3 145 -10 53.1 -110					
13	56 38.4	45 02.2 08.6	342 08.7 35.7	301 18.8 54.8	190 08.8 50.3	223 03.8 144 11 04.1 -110					
14	71 40.9	60 01.9 09.8	357 09.4 35.9	316 20.9 54.7	205 11.4 50.3	237 37.2 144 11 15.1 -109					
15	86 43.3	75 01.6 .. 10.9	12 10.1 .. 36.1	331 23.1 .. 54.7	220 14.1 .. 50.2	252 10.6 144 *11 26.0 -109					
16	101 45.8	90 01.3 12.1	27 10.7 36.3	346 25.2 54.6	235 16.7 50.2	266 44.0 143 11 36.9 -108					
17	116 48.3	105 01.0 13.2	42 11.4 36.5	1 27.3 54.6	250 19.4 50.1	281 17.3 144 11 47.7 -108					
18	131 50.7	120 00.7 + 3 14.4	57 12.0 +23 36.7	16 29.4 +21 54.5	265 22.0 -14 50.1	295 50.7 143 -11 58.5 -107					
19	146 53.2	135 00.3 15.5	72 12.7 36.9	31 31.5 54.5	280 24.7 50.0	310 24.0 143 12 09.2 -106					
20	161 55.7	150 00.0 16.7	87 13.4 37.1	46 33.6 54.4	295 27.3 50.0	324 57.3 142 12 19.8 -106					
21	176 58.1	164 59.7 .. 17.8	102 14.0 .. 37.3	61 35.7 .. 54.3	310 30.0 .. 49.9	339 30.5 143 *12 30.4 -105					
22	192 00.6	179 59.4 19.0	117 14.7 37.4	76 37.8 54.3	325 32.6 49.9	354 03.8 142 12 40.9 -105					
23	207 03.1	194 59.1 20.1	132 15.4 37.6	91 39.9 54.2	340 35.3 49.8	8 37.0 141 12 51.4 -104					
5 0	222 05.5	209 58.8 + 3 21.3	147 16.0 +23 37.8	106 42.0 +21 54.2	355 37.9 -14 49.8	23 10.1 142 -13 01.8 -104					
1	237 08.0	224 58.4 22.4	162 16.7 38.0	121 44.1 54.1	10 40.6 49.7	37 43.3 141 13 12.2 -103					
2	252 10.4	239 58.1 23.6	177 17.3 38.2	136 46.2 54.1	25 43.2 49.7	52 16.4 141 13 22.5 -102					
3	267 12.9	254 57.8 .. 24.7	192 18.0 .. 38.4	151 48.3 .. 54.0	40 45.9 .. 49.6	66 49.5 141 *13 32.7 -102					
4	282 15.4	269 57.5 25.9	207 18.7 38.6	166 50.4 53.9	55 48.5 49.6	81 22.6 140 13 42.9 -101					
5	297 17.8	284 57.2 27.0	222 19.3 38.7	181 52.5 53.9	70 51.2 49.5	95 55.6 140 13 53.0 -101					
6	312 20.3	299 56.8 + 3 28.2	237 20.0 +23 38.9	196 54.6 +21 53.8	85 53.8 -14 49.5	110 28.6 140 -14 03.1 -99					
7	327 22.8	314 56.5 29.3	252 20.7 39.1	211 56.8 53.8	100 56.5 49.4	125 01.6 139 14 13.0 -100					
8	342 25.2	329 56.2 30.4	267 21.3 39.3	226 58.9 53.7	115 59.1 49.4	139 34.5 140 14 23.0 -98					
9	357 27.7	344 55.9 .. 31.6	282 22.0 .. 39.5	242 01.0 .. 53.7	131 01.8 .. 49.3	154 07.5 138 *14 32.8 -98					
10	12 30.2	359 55.6 32.7	297 22.6 39.7	257 03.1 53.6	146 04.4 49.3	168 40.3 139 14 42.6 -97					
11	27 32.6	14 55.2 33.9	312 23.3 39.8	272 05.2 53.5	161 07.1 49.2	183 13.2 138 14 52.3 -97					
12	42 35.1	29 54.9 + 3 35.0	327 24.0 +23 40.0	287 07.3 +21 53.5	176 09.7 -14 49.2	197 46.0 138 -15 02.0 -96					
13	57 37.5	44 54.6 36.2	342 24.6 40.2	302 09.4 53.4	191 12.4 49.1	212 18.8 137 15 11.6 -95					
14	72 40.0	59 54.3 37.3	357 25.3 40.4	317 11.5 53.4	206 15.0 49.1	226 51.5 138 15 21.1 -94					
15	87 42.5	74 54.0 .. 38.5	12 25.9 .. 40.6	332 13.6 .. 53.3	221 17.7 .. 49.0	241 24.3 137 *15 30.5 -94					
16	102 44.9	89 53.7 39.6	27 26.6 40.8	347 15.7 53.3	236 20.3 49.0	255 57.0 136 15 39.9 -93					
17	117 47.4	104 53.3 40.8	42 27.3 40.9	2 17.8 53.2	251 23.0 48.9	270 29.6 136 15 49.2 -92					
18	132 49.9	119 53.0 + 3 41.9	57 27.9 +23 41.1	17 19.9 +21 53.1	266 25.6 -14 48.9	285 02.2 136 -15 58.4 -92					
19	147 52.3	134 52.7 43.1	72 28.6 41.3	32 22.0 53.1	281 28.3 48.8	299 34.8 136 16 07.6 -91					
20	162 54.8	149 52.4 44.2	87 29.3 41.5	47 24.1 53.0	296 30.9 48.8	314 07.4 135 16 16.7 -90					
21	177 57.3	164 52.0 .. 45.3	102 29.9 .. 41.7	62 26.2 .. 53.0	311 33.6 .. 48.7	328 39.9 134 *16 25.7 -89					
22	192 59.7	179 51.7 46.5	117 30.6 41.8	77 28.3 52.9	326 36.2 48.7	343 12.3 135 16 34.6 -89					
23	208 02.2	194 51.4 47.6	132 31.2 42.0	92 30.4 52.9	341 38.9 48.6	357 44.8 134 16 43.5 -88					
6 0	223 04.7	209 51.1 + 3 48.8	147 31.9 +23 42.2	107 32.5 +21 52.8	356 41.5 -14 48.6	12 17.2 134 -16 52.3 -87					
1	238 07.1	224 50.8 49.9	162 32.6 42.4	122 34.6 52.7	11 44.2 48.5	26 49.6 133 17 01.0 -86					
2	253 09.6	239 50.4 51.1	177 33.2 42.6	137 36.7 52.7	26 46.8 48.5	41 21.9 133 17 09.6 -86					
3	268 12.0	254 50.1 .. 52.2	192 33.9 .. 42.7	152 38.8 .. 52.6	41 49.5 .. 48.4	55 54.2 133 *17 18.2 -85					
4	283 14.5	269 49.8 53.4	207 34.6 42.9	167 40.9 52.6	56 52.1 48.4	70 26.5 132 17 26.7 -84					
5	298 17.0	284 49.5 54.5	222 35.2 43.1	182 43.0 52.5	71 54.8 48.3	84 58.7 132 17 35.1 -83					
6	313 19.4	299 49.2 + 3 55.7	237 35.9 +23 43.3	197 45.1 +21 52.4	86 57.4 -14 48.3	99 30.9 132 -17 43.4 -82					
7	328 21.9	314 48.8 56.8	252 36.5 43.4	212 47.2 52.4	102 00.1 48.2	114 03.1 131 17 51.6 -82					
8	343 24.4	329 48.5 57.9	267 37.2 43.6	227 49.3 52.3	117 02.7 48.2	128 35.2 131 17 59.8 -80					
9	358 26.8	344 48.2 * 3 59.1	282 37.9 .. 43.8	242 51.4 .. 52.3	132 05.4 .. 48.1	143 07.3 130 *18 07.8 -80					
10	13 29.3	359 47.9 4 00.2	297 38.5 44.0	257 53.5 52.2	147 08.0 48.1	157 39.3 130 18 15.8 -79					
11	28 31.8	14 47.5 01.4	312 39.2 44.1	272 55.6 52.2	162 10.7 48.0	172 11.3 130 18 23.7 -79					
12	43 34.2	29 47.2 + 4 02.5	327 39.8 +23 44.3	287 57.7 +21 52.1	177 13.3 -14 48.0	186 43.3 129 -18 31.6 -77					
13	58 36.7	44 46.9 03.7	342 40.5 44.5	302 59.8 52.0	192 16.0 47.9	201 15.2 129 18 39.3 -77					
14	73 39.2	59 46.6 04.8	357 41.2 44.7	318 01.9 52.0	207 18.6 47.9	215 47.1 129 18 47.0 -75					
15	88 41.6	74 46.3 .. 06.0	12 41.8 .. 44.8	333 04.0 .. 51.9	222 21.3 .. 47.8	230 19.0 128 *18 54.5 -75					
16	103 44.1	89 45.9 07.1	27 42.5 45.0	348 06.1 51.9	237 23.9 47.8	244 50.8 128 19 02.0 -74					
17	118 46.5	104 45.6 08.2	42 43.2 45.2	3 08.2 51.8	252 26.6 47.7	259 22.6 128 19 09.4 -73					
18	133 49.0	119 45.3 + 4 09.4	57 43.8 +23 45.4	18 10.3 +21 51.7	267 29.2 -14 47.7	273 54.4 127 -19 16.7 -72					
19	148 51.5	134 45.0 10.5	72 44.5 45.5	33 12.4 51.7	282 31.9 47.6	288 26.1 127 19 23.9 -72					
20	163 53.9	149 44.6 11.7	87 45.1 45.7	48 14.5 51.6	297 34.5 47.5	302 57.8 126 19 31.1 -70					
21	178 56.4	164 44.3 .. 12.8	102 45.8 .. 45.9	63 16.6 .. 51.6	312 37.2 .. 47.5	317 29.4 127 *19 38.1 -70					
22	193 58.9	179 44.0 14.0	117 46.5 46.0	78 18.7 51.5	327 39.8 47.4	332 01.1 125 19 45.1 -68					
23	209 01.3	194 43.7 15.1	132 47.1 46.2	93 20.7 51.5	342 42.5 47.4	346 32.6 126 19 51.9 -68					
24	224 03.8	209 43.3 + 4 16.3	147 47.8 +23 46.4	108 22.8 +21 51.4	357 45.1 -14 47.3	1 04.2 125 -19 58.7 -67					
code	-	- 3 + 12	+ 6 + 2	+ 21 - 1	+ 27 + 1						

G M T	SUN		STARS				Lat.	Sunrise	Twit. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.	No.	Name	SHA	Dec.								Alt.	Sun's Low'r Limb	Venus	Mars		
										4	5	6	7						
h	°	'	°	'	°	'	N	h	m	h	m	h	m	h	m				
4	0	180 47.3	+15 40.4	7	Acamar	315 51.7	-40 29.0	72	1 22	///	19 07	21 33	■	Alt.					
	1	195 47.4	41.2	5	Achernar	335 59.6	-57 27.6	70	2 11	///	18 44	20 42	■						
	2	210 47.4	41.9	30	Acrux	173 57.6	-62 51.5	68	2 42	///	18 26	20 11	22 06	■					
	3	225 47.5	42.7	19	Adhara	255 47.0	-28 54.8	66	3 05	///	18 12	19 48	21 27	23 07					
	4	240 47.6	43.4	10	Aldebaran	291 39.7	+16 25.2	64	3 22	///	18 01	19 30	21 00	22 26	0				
	5	255 47.6	44.1					62	3 37	///	17 51	19 15	20 39	21 58	30	0.2	0.1	0.1	
	6	270 47.7	+15 44.9	32	Alioth	166 58.3	+56 12.1	60	3 49	///	17 43	19 03	20 22	21 36	45	0.2	0.1	0.0	
	7	285 47.8	45.6	34	Alkaid	153 32.6	+49 32.1	58	4 00	///	17 36	18 52	20 08	21 19	60	0.2	0.1	0.0	
	8	300 47.8	46.3	55	Al Na'ir	28 38.4	-47 10.4	56	4 09	0 07	17 29	18 43	19 56	21 04	75	0.2	0.0	0.0	
	9	315 47.9	47.0	15	Alnilam	276 30.8	-1 13.8	54	4 17	1 17	17 24	18 35	19 45	20 52	90	0.2	0.0	0.0	
	10	330 48.0	47.8	25	Alphard	218 38.9	-8 28.1	52	4 24	1 47	17 18	18 28	19 36	20 40					
	11	345 48.0	48.5					50	4 31	2 09	17 14	18 21	19 27	20 31					
	12	0 48.1	+15 49.2	41	Alphecca	126 47.5	+26 51.7	45	4 45	2 46	17 04	18 07	19 10	20 10	Moon's Lower Limb				
	13	15 48.1	50.0	1	Alpheratz	358 28.9	+28 50.5	40	4 56	3 12	16 56	17 56	18 55	19 53	Add				
	14	30 48.2	50.7	51	Altair	62 50.6	+8 44.9	35	5 06	3 32	16 48	17 46	18 43	19 39	Alt.	4	5	6	
	15	45 48.3	51.4	2	Ankaa	353 58.9	-42 32.7	30	5 14	3 47	16 42	17 38	18 33	19 27	0				
	16	60 48.3	52.2	42	Antares	113 19.4	-26 20.2	20	5 29	4 12	16 32	17 23	18 15	19 06	4	12.9	12.4	12.1	
	17	75 48.4	52.9					10	5 42	4 29	16 23	17 10	17 59	18 48	8	12.9	12.4	12.1	
	18	90 48.5	+15 53.6	37	Arcturus	146 35.1	+19 24.7	0	5 53	4 42	16 14	16 58	17 44	18 32	12	12.9	12.4	12.2	
	19	105 48.5	54.3	43	Atria	108 59.9	-68 56.9	10	6 05	4 53	16 05	16 47	17 30	18 15	16	12.9	12.4	12.2	
	20	120 48.6	55.1	22	Avior	234 36.1	-59 22.3	20	6 17	5 02	15 56	16 34	17 14	17 57	20	13.0	12.5	12.2	
	21	135 48.6	55.8	13	Bellatrix	279 19.0	+6 18.6	30	6 31	5 09	15 46	16 20	16 57	17 37	21	13.0	12.6	12.3	
	22	150 48.7	56.5	16	Betelge'se	271 48.7	+7 24.0	35	6 39	5 12	15 40	16 12	16 46	17 25	24	13.1	12.6	12.4	
	23	165 48.8	57.2					40	6 48	5 15	15 33	16 02	16 35	17 11	28	13.2	12.7	12.5	
				17	Canopus	264 15.9	-52 40.5	45	6 59	5 17	15 26	15 52	16 21	16 55	32	13.2	12.8	12.6	
5	0	180 48.8	+15 58.0	12	Capella	281 39.3	+45 57.4	50	7 11	5 20	15 16	15 38	16 04	16 35	36	13.3	12.9	12.7	
	1	195 48.9	58.7	53	Deneb	50 01.2	+45 07.0	52	7 17	5 20	15 12	15 32	15 56	16 26	40	13.4	13.0	12.8	
	2	210 48.9	59.4	28	Denebola	183 17.8	+14 49.2	54	7 24	5 21	15 07	15 26	15 48	16 16	44	13.5	13.1	12.9	
	3	225 49.0	-16 00.1	4	Diphda	349 39.8	-18 13.8	56	7 31	5 21	15 02	15 18	15 38	16 04	48	13.6	13.3	13.1	
	4	240 49.1	00.9					58	7 39	5 21	14 57	15 10	15 27	15 50	52	13.7	13.4	13.2	
	5	255 49.1	01.6	27	Dubhe	194 44.6	+61 59.7	60	7 49	5 22	14 50	15 00	15 14	15 34	56	13.9	13.5	13.4	
	6	270 49.2	+16 02.3	14	Elnath	279 08.0	+28 34.3	S							60	14.0	13.7	13.5	
	7	285 49.2	03.0	47	Eltanin	91 06.0	+51 29.4								64	14.1	13.9	13.7	
	8	300 49.3	03.7	54	Enif	34 29.9	+9 40.1								68	14.3	14.0	13.9	
	9	315 49.4	04.5	56	Fomalhaut	16 12.1	-29 51.4								72	14.4	14.2	14.1	
	10	330 49.4	05.2					N	h	m	h	m	h	m	h	m			
	11	345 49.5	05.9	31	Gacrux	172 49.2	-56 52.1	72	22 42	///	1 50	1 22	0 30	■	76	14.5	14.4	14.3	
	12	0 49.5	+16 06.6	29	Gienah	176 36.9	-17 17.9	70	21 47	///	2 04	1 46	1 21	■	80	14.7	14.5	14.4	
	13	15 49.6	07.3	35	Hadar	149 49.2	-60 09.7	68	21 15	///	2 15	2 05	1 54	1 35	84	14.8	14.7	14.6	
	14	30 49.7	08.0	6	Hamal	328 50.3	+23 15.1	66	20 52	///	2 24	2 21	2 18	2 15	88	14.8	14.7	14.6	
	15	45 49.7	08.8	48	Kaus Aust.	84 41.3	-34 24.4	64	20 33	///	2 32	2 33	2 36	2 43	90	14.9	14.8	14.8	
	16	60 49.8	09.5					62	20 18	///	2 38	2 44	2 52	3 04	Add to table, back cover				
	17	75 49.8	10.2	40	Kochab	137 16.6	+74 20.2	60	20 06	///	2 44	2 53	3 05	3 21	Moon's Upper Limb				
	18	90 49.9	+16 10.9	57	Markab	14 21.9	+14 57.8	58	19 55	///	2 49	3 01	3 16	3 36	Subtract				
	19	105 49.9	11.6	8	Menkar	315 00.9	+3 54.9	56	19 46	///	2 54	3 08	3 26	3 48	Alt.	4	5	6	
	20	120 50.0	12.3	36	Menkent	148 58.6	-36 09.3	54	19 38	22 44	2 58	3 15	3 35	3 59	0				
	21	135 50.0	13.1	24	Miapl'dus	221 49.1	-69 32.4	52	19 30	22 11	3 02	3 21	3 42	4 09	4	17.1	17.4	17.5	
	22	150 50.1	13.8					50	19 24	21 49	3 05	3 26	3 49	4 18	8	17.1	17.4	17.5	
	23	165 50.2	14.5	9	Mirfak	309 43.3	+49 42.3	45	19 10	21 10	3 12	3 37	4 04	4 36	12	17.0	17.3	17.4	
				50	Nunki	76 52.1	-26 21.2	40	18 58	20 43	3 19	3 46	4 17	4 51	16	17.0	17.2	17.4	
6	0	180 50.2	+16 15.2	52	Peacock	54 27.6	-56 52.5	35	18 48	20 23	3 24	3 55	4 28	5 04	20	16.9	17.2	17.3	
	1	195 50.3	15.9	21	Pollux	244 21.1	+28 08.2	30	18 39	20 07	3 29	4 02	4 37	5 15	24	16.9	17.1	17.2	
	2	210 50.3	16.6	20	Procyon	245 45.4	+5 20.3	20	18 25	19 44	3 37	4 14	4 53	5 35	28	16.8	17.0	17.2	
	3	225 50.4	17.3					10	18 12	19 26	3 44	4 25	5 07	5 51	32	16.7	16.9	17.1	
	4	240 50.4	18.0	46	R'alhague	96 46.6	+12 35.3	0	18 00	19 12	3 51	4 35	5 20	6 07	36	16.6	16.8	16.9	
	5	255 50.5	18.8	26	Regulus	208 29.7	+12 11.1	10	17 49	19 01	3 58	4 45	5 34	6 23	40	16.5	16.7	16.8	
	6	270 50.5	+16 19.5	11	Rigel	281 54.2	-8 15.2	20	17 36	18 51	4 05	4 56	5 48	6 40	44	16.4	16.6	16.7	
	7	285 50.6	20.2	38	Rigel Kent.	140 50.8	-60 39.4	30	17 22	18 44	4 14	5 09	6 04	6 59	48	16.3	16.5	16.6	
	8	300 50.6	20.9	44	Sabik	103 02.2	-15 40.3	35	17 14	18 40	4 19	5 16	6 14	7 10	52	16.2	16.3	16.4	
	9	315 50.7	21.6					40	17 05	18 37	4 24	5 25	6 25	7 24	56	16.1	16.2	16.2	
	10	330 50.8	22.3	3	Schedar	350 30.8	+56 17.5	45	16 54	18 34	4 31	5 34	6 37	7 39	60	16.0	16.0	16.1	
	11	345 50.8	23.0	45	Shaula	97 20.7	-37 04.4	50	16 41	18 32	4 38	5 46	6 53	7 58	64	15.8	15.9	15.9	
	12	0 50.9	+16 23.7	18	Sirius	259 12.3	-16 39.4	52	16 35	18 31	4 42	5 52	7 00	8 07	68	15.7	15.7	15.7	
	13	15 50.9	24.4	33	Spica	159 16.9	-10 55.9	54	16 29	18 31	4 46	5 58	7 09	8 17	72	15.6	15.6	15.6	
	14	30 51.0	25.1	23	Suhail	223 24.6	-43 15.5	56	16 21	18 29	4 50	6 05	7 18	8 29	76	15.4	15.4	15.4	
	15	45 51.0	25.8					58	16 13	18 29	4 55	6 12	7 28	8 42	80	15.3	15.2	15.2	
	16	60 51.1	26.5	49	Vega	81 08.2	+38 44.2	60	16 04	18 29	5 01	6 21	7 41	8 58	84	15.1	15.0	15.0	
	17	75 51.1	27.3	39	Zub'g'bi	137 53.4	-15 51.6	S							88	15.0	14.9		

G M T	T GHA	VENUS -3.4		MARS 1.9		JUPITER -1.6		SATURN 0.3		MOON			
		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
h	°	°	°	°	°	°	°	°	°	°		°	
7 0	224 03.8	209 43.3	+ 4 16.3	147 47.8	+23 46.4	108 22.8	+21 51.4	357 45.1	-14 47.3	1 04.2	125	-19 58.7	- 67
1	239 06.3	224 43.0	17.4	162 48.4	46.5	123 24.9	51.3	12 47.8	47.3	15 35.7	124	20 05.4	- 66
2	254 08.7	239 42.7	18.5	177 49.1	46.7	138 27.0	51.3	27 50.4	47.2	30 07.1	125	20 12.0	- 65
3	269 11.2	254 42.4	19.7	192 49.8	46.9	153 29.1	51.2	42 53.1	47.2	44 38.6	124	20 18.5	- 64
4	284 13.6	269 42.0	20.8	207 50.4	47.1	168 31.2	51.2	57 55.7	47.1	59 10.0	123	20 24.9	- 63
5	299 16.1	284 41.7	22.0	222 51.1	47.2	183 33.3	51.1	72 58.4	47.1	73 41.3	124	20 31.2	- 62
6	314 18.6	299 41.4	+ 4 23.1	237 51.7	+23 47.4	198 35.4	+21 51.0	88 01.0	-14 47.0	88 12.7	123	-20 37.4	- 61
7	329 21.0	314 41.1	24.3	252 52.4	47.6	213 37.5	51.0	103 03.7	47.0	102 44.0	122	20 43.5	- 60
8	344 23.5	329 40.7	25.4	267 53.1	47.7	228 39.6	50.9	118 06.3	46.9	117 15.2	123	20 49.5	- 60
9	359 26.0	344 40.4	26.5	282 53.7	47.9	243 41.7	50.9	133 09.0	46.9	131 46.5	122	20 55.5	- 58
10	14 28.4	359 40.1	27.7	297 54.4	48.1	258 43.8	50.8	148 11.6	46.8	146 17.7	121	21 01.3	- 57
11	29 30.9	14 39.8	28.8	312 55.1	48.2	273 45.9	50.7	163 14.3	46.8	160 48.8	121	21 07.0	- 57
12	44 33.4	29 39.4	+ 4 30.0	327 55.7	+23 48.4	288 48.0	+21 50.7	178 17.0	-14 46.7	175 19.9	121	-21 12.7	- 55
13	59 35.8	44 39.1	31.1	342 56.4	48.6	303 50.1	50.6	193 19.6	46.7	189 51.0	121	21 18.2	- 55
14	74 38.3	59 38.8	32.3	357 57.0	48.7	318 52.2	50.6	208 22.3	46.6	204 22.1	120	21 23.7	- 53
15	89 40.8	74 38.5	33.4	12 57.7	48.9	333 54.3	50.5	223 24.9	46.6	218 53.1	120	21 29.0	- 52
16	104 43.2	89 38.1	34.5	27 58.4	49.1	348 56.3	50.4	238 27.6	46.5	233 24.1	120	21 34.2	- 52
17	119 45.7	104 37.8	35.7	42 59.0	49.2	3 58.4	50.4	253 30.2	46.5	247 55.1	120	21 39.4	- 50
18	134 48.1	119 37.5	+ 4 36.8	57 59.7	+23 49.4	19 00.5	+21 50.3	268 32.9	-14 46.4	262 26.1	119	-21 44.4	- 50
19	149 50.6	134 37.1	38.0	73 00.3	49.5	34 02.6	50.3	283 35.5	46.4	276 57.0	118	21 49.4	- 48
20	164 53.1	149 36.8	39.1	88 01.0	49.7	49 04.7	50.2	298 38.2	46.3	291 27.8	119	21 54.2	- 47
21	179 55.5	164 36.5	40.2	103 01.7	49.9	64 06.8	50.1	313 40.8	46.3	305 58.7	118	21 58.9	- 47
22	194 58.0	179 36.2	41.4	118 02.3	50.0	79 08.9	50.1	328 43.5	46.2	320 29.5	118	22 03.6	- 45
23	210 00.5	194 35.8	42.5	133 03.0	50.2	94 11.0	50.0	343 46.1	46.2	335 00.3	118	22 08.1	- 44
8 0	225 02.9	209 35.5	+ 4 43.7	148 03.6	+23 50.4	109 13.1	+21 50.0	358 48.8	-14 46.1	349 31.1	117	-22 12.5	- 44
1	240 05.4	224 35.2	44.8	163 04.3	50.5	124 15.2	49.9	13 51.4	46.1	4 01.8	117	22 16.9	- 42
2	255 07.9	239 34.8	45.9	178 05.0	50.7	139 17.3	49.8	28 54.1	46.0	18 32.5	117	22 21.1	- 41
3	270 10.3	254 34.5	47.1	193 05.6	50.8	154 19.3	49.8	43 56.7	46.0	33 03.2	117	22 25.2	- 40
4	285 12.8	269 34.2	48.2	208 06.3	51.0	169 21.4	49.7	58 59.4	45.9	47 33.9	116	22 29.2	- 39
5	300 15.3	284 33.9	49.4	223 06.9	51.2	184 23.5	49.7	74 02.0	45.9	62 04.5	116	22 33.1	- 38
6	315 17.7	299 33.5	+ 4 50.5	238 07.6	+23 51.3	199 25.6	+21 49.6	89 04.7	-14 45.8	76 35.1	116	-22 36.9	- 37
7	330 20.2	314 33.2	51.6	253 08.3	51.5	214 27.7	49.5	104 07.3	45.8	91 05.7	116	22 40.6	- 36
8	345 22.6	329 32.9	52.8	268 08.9	51.6	229 29.8	49.5	119 10.0	45.7	105 36.3	115	22 44.2	- 35
9	0 25.1	344 32.5	53.9	283 09.6	51.8	244 31.9	49.4	134 12.6	45.7	120 06.8	115	22 47.7	- 34
10	15 27.6	359 32.2	55.1	298 10.3	52.0	259 34.0	49.4	149 15.3	45.6	134 37.3	115	22 51.1	- 33
11	30 30.0	14 31.9	56.2	313 10.9	52.1	274 36.1	49.3	164 17.9	45.6	149 07.8	115	22 54.4	- 31
12	45 32.5	29 31.6	+ 4 57.3	328 11.6	+23 52.3	289 38.1	+21 49.2	179 20.6	-14 45.5	163 38.3	115	-22 57.5	- 31
13	60 35.0	44 31.2	58.5	343 12.2	52.4	304 40.2	49.2	194 23.2	45.5	178 08.8	114	23 00.6	- 29
14	75 37.4	59 30.9	4 59.6	358 12.9	52.6	319 42.3	49.1	209 25.9	45.4	192 39.2	114	23 03.5	- 29
15	90 39.9	74 30.6	5 00.8	13 13.6	52.7	334 44.4	49.0	224 28.5	45.4	207 09.6	114	23 06.4	- 27
16	105 42.4	89 30.2	01.9	28 14.2	52.9	349 46.5	49.0	239 31.2	45.3	221 40.0	114	23 09.1	- 26
17	120 44.8	104 29.9	03.0	43 14.9	53.1	4 48.6	48.9	254 33.8	45.3	236 10.4	113	23 11.7	- 25
18	135 47.3	119 29.6	+ 5 04.2	58 15.5	+23 53.2	19 50.7	+21 48.9	269 36.5	-14 45.2	250 40.7	114	-23 14.2	- 24
19	150 49.8	134 29.2	05.3	73 16.2	53.4	34 52.8	48.8	284 39.1	45.2	265 11.1	113	23 16.6	- 23
20	165 52.2	149 28.9	06.5	88 16.9	53.5	49 54.8	48.7	299 41.8	45.1	279 41.4	113	23 18.9	- 22
21	180 54.7	164 28.6	07.6	103 17.5	53.7	64 56.9	48.7	314 44.4	45.1	294 11.7	113	23 21.1	- 21
22	195 57.1	179 28.2	08.7	118 18.2	53.8	79 59.0	48.6	329 47.1	45.0	308 42.0	113	23 23.2	- 20
23	210 59.6	194 27.9	09.9	133 18.8	54.0	95 01.1	48.6	344 49.7	45.0	323 12.3	113	23 25.2	- 18
9 0	226 02.1	209 27.6	+ 5 11.0	148 19.5	+23 54.1	110 03.2	+21 48.5	359 52.4	-14 44.9	337 42.6	112	-23 27.0	- 18
1	241 04.5	224 27.2	12.1	163 20.2	54.3	125 05.3	48.4	14 55.0	44.9	352 12.8	113	23 28.8	- 16
2	256 07.0	239 26.9	13.3	178 20.8	54.5	140 07.3	48.4	29 57.7	44.8	6 43.1	112	23 30.4	- 15
3	271 09.5	254 26.6	14.4	193 21.5	54.6	155 09.4	48.3	45 00.3	44.8	21 13.3	112	23 31.9	- 14
4	286 11.9	269 26.2	15.6	208 22.1	54.8	170 11.5	48.2	60 03.0	44.7	35 43.5	112	23 33.3	- 13
5	301 14.4	284 25.9	16.7	223 22.8	54.9	185 13.6	48.2	75 05.7	44.7	50 13.7	112	23 34.6	- 12
6	316 16.9	299 25.6	+ 5 17.8	238 23.5	+23 55.1	200 15.7	+21 48.1	90 08.3	-14 44.6	64 43.9	112	-23 35.8	- 11
7	331 19.3	314 25.3	19.0	253 24.1	55.2	215 17.8	48.1	105 11.0	44.6	79 14.1	112	23 36.9	- 10
8	346 21.8	329 24.9	20.1	268 24.8	55.4	230 19.9	48.0	120 13.6	44.5	93 44.3	112	23 37.9	- 8
9	1 24.2	344 24.6	21.2	283 25.4	55.5	245 21.9	47.9	135 16.3	44.5	108 14.5	112	23 38.7	- 8
10	16 26.7	359 24.2	22.4	298 26.1	55.7	260 24.0	47.9	150 18.9	44.4	122 44.7	111	23 39.5	- 6
11	31 29.2	14 23.9	23.5	313 26.8	55.8	275 26.1	47.8	165 21.6	44.4	137 14.8	112	23 40.1	- 5
12	46 31.6	29 23.6	+ 5 24.7	328 27.4	+23 56.0	290 28.2	+21 47.8	180 24.2	-14 44.3	151 45.0	112	-23 40.6	- 4
13	61 34.1	44 23.2	25.8	343 28.1	56.1	305 30.3	47.7	195 26.9	44.3	166 15.2	111	23 41.0	- 3
14	76 36.6	59 22.9	26.9	358 28.7	56.3	320 32.4	47.6	210 29.5	44.2	180 45.3	112	23 41.3	- 2
15	91 39.0	74 22.6	28.1	13 29.4	56.4	335 34.4	47.6	225 32.2	44.2	195 15.5	111	23 41.5	- 1
16	106 41.5	89 22.2	29.2	28 30.1	56.6	350 36.5	47.5	240 34.8	44.1	209 45.6	112	23 41.6	+ 1
17	121 44.0	104 21.9	30.3	43 30.7	56.7	5 38.6	47.4	255 37.5	44.1	224 15.8	111	23 41.5	+ 1
18	136 46.4	119 21.6	+ 5 31.5	58 31.4	+23 56.8	20 40.7	+21 47.4	270 40.1	-14 44.0	238 45.9	112	-23 41.4	+ 3
19	151 48.9	134 21.2	32.6	73 32.0	57.0	35 42.8	47.3	285 42.8	44.0	253 16.1	111	23 41.1	+ 3
20	166 51.4	149 20.9	33.7	88 32.7	57.1	50 44.8	47.3	300 45.4	43.9	267 46.2	112	23 40.8	+ 5
21	181 53.8	164 20.6	34.9	103 33.4	57.3	65 46.9	47.2	315 48.1	43.9	282 16.4	111	23 40.3	+ 6
22	196 56.3	179 20.2	36.0	118 34.0	57.4	80 49.0	47.1	330 50.7	43.8	296 46.5	112	23 39.7	+ 7
23	211 58.7	194 19.9	37.1	133 34.7	57.6	95 51.1	47.1	345 53.4	43.8	311 16.7	112	23 39.0	+ 9
24	227 01.2	209 19.6	+ 5 38.3	148 35.3	+23 57.7	110 53.2	+21 47.0	0 56.0	-14 43.7	325 46.9	111	-23 38.1	+ 9
code	—	- 4	+ 12	+ 6	+ 1	+ 21	0	+ 26	0				

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.	No.	Name	SHA	Dec.													
										7	8	9	10	Alt.	Sun's Low'r Limb	Venus	Mars		
h	°	'	°	'	°	'	N	h	m	h	m	h	m	h	m	°	'	'	'
7	0	180 51.5	+16 32.2	7	Acamar	315 51.7	-40 28.9	72	0 42	////	■	■	■	■	■	Alt.			
1	1	195 51.5	32.9	5	Achernar	335 59.6	-57 27.6	70	1 51	////	■	■	■	■	■	0	0.2	0.1	0.1
2	2	210 51.6	33.6	30	Acrux	173 57.7	-62 51.5	68	2 27	////	■	■	■	■	■	30	0.2	0.1	0.0
3	3	225 51.6	.. 34.3	19	Adhara	255 47.0	-28 54.8	66	2 53	////	23 07	24 44	0 44	1 42	45	0.2	0.1	0.0	
4	4	240 51.7	35.0	10	Aldebaran	291 39.7	+16 25.2	64	3 12	////	22 26	23 42	24 35	0 35	60	0.2	0.0	0.0	
5	5	255 51.7	35.7					62	3 28	////	21 58	23 07	24 00	0 00	75	0.2	0.0	0.0	
6	6	270 51.8	+16 36.4	32	Alioth	166 58.3	+56 12.1	60	3 41	////	21 36	22 42	23 35	24 12	90	0.2	0.0	0.0	
7	7	285 51.8	37.1	34	Alkaid	153 32.6	+49 32.1	58	3 53	////	21 19	22 22	23 14	23 54					
8	8	300 51.8	37.8	55	Al Na'ir	28 38.4	-47 10.4	56	4 03	////	21 04	22 06	22 58	23 39					
9	9	315 51.9	.. 38.5	15	Alnilam	276 30.8	-1 13.8	54	4 11	0 58	20 52	21 52	22 43	23 25					
10	10	330 51.9	39.2	25	Alphard	218 38.9	-8 28.1	52	4 19	1 35	20 40	21 40	22 31	23 14					
11	11	345 52.0	39.9					50	4 26	1 59	20 31	21 29	22 20	23 04					
12	12	0 52.0	+16 40.6	41	Alphecca	126 47.5	+26 51.7	45	4 41	2 40	20 10	21 06	21 57	22 42	Moon's Lower Limb				
13	13	15 52.1	41.3	1	Alpheratz	358 28.9	+28 50.6	40	4 53	3 08	19 53	20 48	21 39	22 25	Add				
14	14	30 52.1	42.0	51	Altair	62 50.6	+8 44.9	35	5 03	3 28	19 39	20 33	21 24	22 10	Alt.	7	8	9	
15	15	45 52.2	.. 42.6	2	Ankaa	353 58.9	-42 32.7	30	5 12	3 45	19 27	20 20	21 10	21 57	0	11.9	11.7	11.7	
16	16	60 52.2	43.3	42	Antares	113 19.4	-26 20.2	20	5 27	4 09	19 06	19 58	20 48	21 36	4	11.9	11.7	11.7	
17	17	75 52.3	44.0					10	5 41	4 27	18 48	19 38	20 28	21 17	12	11.9	11.8	11.8	
18	18	90 52.3	+16 44.7	37	Arcturus	146 35.1	+19 24.7	0	5 53	4 41	18 32	19 20	20 10	20 59	16	11.9	11.8	11.8	
19	19	105 52.4	45.4	43	Atria	108 59.9	-68 56.9	10	6 05	4 53	18 15	19 02	19 51	20 41	20	12.0	11.9	11.9	
20	20	120 52.4	46.1	22	Avior	234 36.1	-59 22.3	20	6 18	5 03	17 57	18 43	19 32	20 22	24	12.1	12.0	12.0	
21	21	135 52.4	.. 46.8	13	Bellatrix	279 19.0	+6 18.6	30	6 33	5 10	17 37	18 21	19 09	20 00	28	12.2	12.0	12.0	
22	22	150 52.5	47.5	16	Betel'ge	271 48.7	+7 24.0	35	6 41	5 14	17 25	18 08	18 56	19 48	32	12.2	12.1	12.1	
23	23	165 52.5	48.2					40	6 51	5 17	17 11	17 53	18 41	19 33	36	12.4	12.2	12.2	
8	0	180 52.6	+16 48.9	17	Canopus	264 15.9	-52 40.5	45	7 02	5 20	16 55	17 36	18 22	19 15	40	12.5	12.4	12.4	
1	1	195 52.6	49.6	12	Capella	281 39.3	+45 57.4	50	7 16	5 23	16 35	17 14	18 00	18 53	44	12.6	12.5	12.5	
2	2	210 52.7	50.3	53	Deneb	50 01.1	+45 07.0	52	7 22	5 24	16 26	17 03	17 49	18 43	48	12.7	12.6	12.6	
3	3	225 52.7	.. 50.9	28	Denebola	183 17.8	+14 49.2	54	7 29	5 25	16 16	16 51	17 36	18 31	52	12.9	12.8	12.8	
4	4	240 52.7	51.6	4	Diphda	349 39.8	-18 13.8	56	7 37	5 26	16 04	16 38	17 22	18 18	56	13.1	13.0	13.0	
5	5	255 52.8	52.3					58	7 45	5 26	15 50	16 22	17 06	18 02	60	13.2	13.1	13.1	
6	6	270 52.8	+16 53.0	27	Dubhe	194 44.6	+61 59.7	60	7 55	5 27	15 34	16 03	16 46	17 43	64	13.3	13.2	13.2	
7	7	285 52.9	53.7	14	Elnath	279 08.0	+28 34.3	S							68	13.4	13.3	13.3	
8	8	300 52.9	54.4	47	Eltanin	91 06.0	+51 29.4	Lat.	Sunset	Twlt. ends	Moonset				72	13.6	13.5	13.5	
9	9	315 53.0	.. 55.1	54	Enif	34 29.9	+9 40.1	N	h m	h m	7	8	9	10	68	13.8	13.7	13.7	
10	10	330 53.0	55.8	56	Fomalhaut	16 12.1	-29 51.4	h m	h m	h m	h m	h m	h m	h m	76	14.0	13.9	13.9	
11	11	345 53.0	56.4	31	Gacrux	172 49.2	-56 52.1	72	23 38	////	■	■	■	■	80	14.2	14.1	14.1	
12	12	0 53.1	+16 57.1	29	Genah	176 36.9	-17 17.9	70	22 08	////	■	■	■	■	84	14.4	14.3	14.3	
13	13	15 53.1	57.8	35	Hadar	149 49.2	-60 09.7	68	21 29	////	1 35	2 13	2 18	3 03	88	14.6	14.5	14.5	
14	14	30 53.2	58.5	6	Hamal	328 50.3	+23 15.1	66	21 03	////	2 15	2 13	2 18	3 03	90	14.7	14.7	14.7	
15	15	45 53.2	.. 59.2	48	Kaus Aust.	84 41.3	-34 24.4	64	20 43	////	2 43	2 55	3 21	4 10	Add to table, back cover				
16	16	60 53.2	16 59.9					62	20 27	////	3 04	3 23	3 55	4 45	Moon's Upper Limb				
17	17	75 53.3	17 00.5	40	Kochab	137 16.6	+74 20.2	60	20 13	////	3 21	3 45	4 20	5 10	Subtract				
18	18	90 53.3	+17 01.2	57	Markab	14 21.9	+14 57.8	58	20 02	////	3 36	4 03	4 40	5 30	Alt.	7	8	9	
19	19	105 53.3	01.9	8	Menkar	315 00.9	+3 54.9	56	19 52	////	3 48	4 18	4 57	5 47	0	17.7	17.7	17.7	
20	20	120 53.4	02.6	36	Menkent	148 58.6	-36 09.3	54	19 43	23 04	3 59	4 31	5 11	6 01	4	17.6	17.7	17.7	
21	21	135 53.4	.. 03.3	24	Miap'ldus	221 49.2	-69 32.4	52	19 35	22 23	4 09	4 42	5 23	6 13	12	17.6	17.6	17.6	
22	22	150 53.5	03.9					50	19 28	21 58	4 18	4 52	5 34	6 24	16	17.5	17.5	17.5	
23	23	165 53.5	04.6	9	Mirfak	309 43.3	+49 42.3	45	19 13	21 16	4 36	5 13	5 57	6 47	20	17.4	17.4	17.4	
9	0	180 53.5	+17 05.3	50	Nunki	76 52.0	-26 21.2	40	19 01	20 48	4 51	5 30	6 15	7 05	24	17.3	17.7	17.7	
1	1	195 53.6	06.0	52	Peacock	54 27.6	-56 52.5	35	18 50	20 26	5 04	5 45	6 30	7 20	28	17.6	17.7	17.7	
2	2	210 53.6	06.6	21	Pollux	244 21.1	+28 08.2	30	18 41	20 10	5 15	5 57	6 44	7 33	32	17.5	17.6	17.6	
3	3	225 53.6	.. 07.3	20	Procyon	245 45.4	+5 20.3	20	18 26	19 45	5 35	6 19	7 06	7 56	36	17.5	17.5	17.5	
4	4	240 53.7	08.0	46	R'alhague	96 46.6	+12 35.3	10	18 12	19 26	5 51	6 38	7 26	8 15	40	17.4	17.4	17.4	
5	5	255 53.7	08.7	26	Regulus	208 29.7	+12 11.1	10	17 48	19 01	6 23	7 13	8 02	8 52	24	17.3	17.3	17.3	
6	6	270 53.8	+17 09.4	11	Rigel	281 54.2	-8 15.2	20	17 35	18 51	6 40	7 31	8 22	9 11	32	17.2	17.2	17.2	
7	7	285 53.8	10.0	38	Rigel Kent.	140 50.8	-60 39.4	30	17 20	18 42	6 59	7 53	8 45	9 33	36	17.0	17.1	17.1	
8	8	300 53.8	10.7	44	Sabik	103 02.2	-15 40.3	35	17 12	18 39	7 10	8 06	8 58	9 46	40	16.9	17.0	17.0	
9	9	315 53.9	.. 11.4					40	17 02	18 35	7 24	8 20	9 13	10 01	44	16.8	16.8	16.8	
10	10	330 53.9	12.1	3	Schedar	350 30.8	+56 17.5	45	16 51	18 32	7 39	8 38	9 31	10 19	48	16.6	16.7	16.7	
11	11	345 53.9	12.7	45	Shaula	97 20.7	-37 04.4	50	16 37	18 28	7 58	8 59	9 54	10 41	52	16.5	16.5	16.5	
12	12	0 54.0	+17 13.4	18	Sirius	259 12.3	-16 39.4	52	16 31	18 28	8 07	9 09	10 05	10 52	56	16.3	16.3	16.3	
13	13	15 54.0	14.1	33	Spica	159 16.9	-10 55.9	54	16 24	18 27	8 17	9 21	10 17	11 04	60	16.1	16.1	16.1	
14	14	30 54.0	14.7	23	Suhail	223 24.6	-43 15.5	56	16 16	18 25	8 29	9 34	10 31	11 17	64	15.9	16.0	16.0	
15	15	45 54.1	.. 15.4																

G M T	VENUS -3.3		MARS 1.9		JUPITER -1.6		SATURN 0.3		MOON		
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.
10 0	227 01.2	209 19.6 + 5 38.3	148 35.3 +23 57.7	110 53.2 +21 47.0	0 56.0 -14 43.7	325 46.9 111 -23 38.1 + 9					
1	242 03.7	224 19.2 39.4	163 36.0 57.9	125 55.2 46.9	15 58.7 43.7	340 17.0 112 23 37.2 + 10					
2	257 06.1	239 18.9 40.5	178 36.7 58.0	140 57.3 46.9	31 01.3 43.6	354 47.2 112 23 36.2 + 12					
3	272 08.6	254 18.5 .. 41.7	193 37.3 .. 58.2	155 59.4 .. 46.8	46 04.0 .. 43.6	9 17.4 112 -23 35.0 + 13					
4	287 11.1	269 18.2 42.8	208 38.0 58.3	171 01.5 46.8	61 06.6 43.5	23 47.6 112 23 33.7 + 14					
5	302 13.5	284 17.9 43.9	223 38.6 58.4	186 03.6 46.7	76 09.3 43.5	38 17.8 112 23 32.3 + 14					
6	317 16.0	299 17.5 + 5 45.1	238 39.3 +23 58.6	201 05.6 +21 46.6	91 11.9 -14 43.4	52 48.0 112 -23 30.9 + 17					
7	332 18.5	314 17.2 46.2	253 40.0 58.7	216 07.7 46.6	106 14.6 43.4	67 18.2 112 23 29.2 + 17					
8	347 20.9	329 16.9 47.3	268 40.6 58.9	231 09.8 46.5	121 17.2 43.3	81 48.4 112 23 27.5 + 18					
9	2 23.4	344 16.5 .. 48.5	283 41.3 .. 59.0	246 11.9 .. 46.4	136 19.9 .. 43.2	96 18.6 113 -23 25.7 + 19					
10	17 25.9	359 16.2 49.6	298 41.9 59.2	261 14.0 46.4	151 22.5 43.2	110 48.9 112 23 23.8 + 21					
11	32 28.3	14 15.8 50.7	313 42.6 59.3	276 16.0 46.3	166 25.2 43.1	125 19.1 113 23 21.7 + 21					
12	47 30.8	29 15.5 + 5 51.9	328 43.3 +23 59.4	291 18.1 +21 46.2	181 27.8 -14 43.1	139 49.4 112 -23 19.6 + 23					
13	62 33.2	44 15.2 53.0	343 43.9 59.6	306 20.2 46.2	196 30.5 43.0	154 19.6 113 23 17.3 + 24					
14	77 35.7	59 14.8 54.1	358 44.6 59.7	321 22.3 46.1	211 33.1 43.0	168 49.9 113 23 14.9 + 25					
15	92 38.2	74 14.5 .. 55.3	13 45.2 -23 59.9	336 24.3 .. 46.1	226 35.8 .. 42.9	183 20.2 113 -23 12.4 + 26					
16	107 40.6	89 14.1 56.4	28 45.9 24 00.0	351 26.4 46.0	241 38.4 42.9	197 50.5 114 23 09.8 + 27					
17	122 43.1	104 13.8 57.5	43 46.6 00.1	6 28.5 45.9	256 41.1 42.8	212 20.9 113 23 07.1 + 28					
18	137 45.6	119 13.5 + 5 58.7	58 47.2 +24 00.3	21 30.6 +21 45.9	271 43.8 -14 42.8	226 51.2 114 -23 04.3 + 29					
19	152 48.0	134 13.1 5 59.8	73 47.9 00.4	36 32.7 45.8	286 46.4 42.7	241 21.6 113 23 01.4 + 30					
20	167 50.5	149 12.8 6 00.9	88 48.5 00.6	51 34.7 45.7	301 49.1 42.7	255 51.9 114 22 58.4 + 32					
21	182 53.0	164 12.4 .. 02.1	103 49.2 .. 00.7	66 36.8 .. 45.7	316 51.7 .. 42.6	270 22.3 114 -22 55.2 + 32					
22	197 55.4	179 12.1 03.2	118 49.9 00.8	81 38.9 45.6	331 54.4 42.6	284 52.7 115 22 52.0 + 34					
23	212 57.9	194 11.8 04.3	133 50.5 01.0	96 41.0 45.5	346 57.0 42.5	299 23.2 114 22 48.6 + 35					
11 0	228 00.4	209 11.4 + 6 05.4	148 51.2 +24 01.1	111 43.0 +21 45.5	1 59.7 -14 42.5	313 53.6 115 -22 45.1 + 35					
1	243 02.8	224 11.1 06.6	163 51.8 01.2	126 45.1 45.4	17 02.3 42.4	328 24.1 115 22 41.6 + 37					
2	258 05.3	239 10.7 07.7	178 52.5 01.4	141 47.2 45.4	32 05.0 42.4	342 54.6 115 22 37.9 + 38					
3	273 07.7	254 10.4 .. 08.8	193 53.2 .. 01.5	156 49.3 .. 45.3	47 07.6 .. 42.3	357 25.1 115 -22 34.1 + 39					
4	288 10.2	269 10.1 10.0	208 53.8 01.6	171 51.3 45.2	62 10.3 42.3	11 55.6 116 22 30.2 + 40					
5	303 12.7	284 09.7 11.1	223 54.5 01.8	186 53.4 45.2	77 12.9 42.2	26 26.2 115 22 26.2 + 41					
6	318 15.1	299 09.4 + 6 12.2	238 55.1 +24 01.9	201 55.5 +21 45.1	92 15.6 -14 42.2	40 56.7 116 -22 22.1 + 42					
7	333 17.6	314 09.0 13.4	253 55.8 02.0	216 57.6 45.0	107 18.2 42.1	55 27.3 116 22 17.9 + 43					
8	348 20.1	329 08.7 14.5	268 56.5 02.2	231 59.6 45.0	122 20.9 42.1	69 57.9 117 22 13.6 + 44					
9	3 22.5	344 08.3 .. 15.6	283 57.1 .. 02.3	247 01.7 .. 44.9	137 23.5 .. 42.0	84 28.6 116 -22 09.2 + 46					
10	18 25.0	359 08.0 16.7	298 57.8 02.5	262 03.8 44.8	152 26.2 42.0	98 59.2 117 22 04.6 + 46					
11	33 27.5	14 07.7 17.9	313 58.4 02.6	277 05.9 44.8	167 28.8 41.9	113 29.9 117 22 00.0 + 47					
12	48 29.9	29 07.3 + 6 19.0	328 59.1 +24 02.7	292 07.9 +21 44.7	182 31.5 -14 41.9	128 00.6 117 -21 55.3 + 49					
13	63 32.4	44 07.0 20.1	343 59.8 02.8	307 10.0 44.6	197 34.1 41.8	142 31.3 118 21 50.4 + 49					
14	78 34.9	59 06.6 21.2	359 00.4 03.0	322 12.1 44.6	212 36.8 41.8	157 02.1 118 21 45.5 + 51					
15	93 37.3	74 06.3 .. 22.4	14 01.1 .. 03.1	337 14.1 .. 44.5	227 39.4 .. 41.7	171 32.9 118 -21 40.4 + 51					
16	108 39.8	89 05.9 23.5	29 01.7 03.2	352 16.2 44.5	242 42.1 41.7	186 03.7 118 21 35.3 + 53					
17	123 42.2	104 05.6 24.6	44 02.4 03.4	7 18.3 44.4	257 44.7 41.6	200 34.5 118 21 30.0 + 53					
18	138 44.7	119 05.2 + 6 25.8	59 03.1 +24 03.5	22 20.4 +21 44.3	272 47.4 -14 41.6	215 05.3 119 -21 24.7 + 55					
19	153 47.2	134 04.9 26.9	74 03.7 03.6	37 22.4 44.3	287 50.0 41.5	229 36.2 119 21 19.2 + 55					
20	168 49.6	149 04.5 28.0	89 04.4 03.8	52 24.5 44.2	302 52.7 41.5	244 07.1 120 21 13.7 + 57					
21	183 52.1	164 04.2 .. 29.1	104 05.0 .. 03.9	67 26.6 .. 44.1	317 55.3 .. 41.4	258 38.1 119 -21 08.0 + 57					
22	198 54.6	179 03.9 30.3	119 05.7 04.0	82 28.6 44.1	332 58.0 41.4	273 09.0 120 21 02.3 + 59					
23	213 57.0	194 03.5 31.4	134 06.4 04.2	97 30.7 44.0	348 00.6 41.3	287 40.0 120 20 56.4 + 59					
12 0	228 59.5	209 03.2 + 6 32.5	149 07.0 +24 04.3	112 32.8 +21 43.9	3 03.3 -14 41.3	302 11.0 121 -20 50.5 + 61					
1	244 02.0	224 02.8 33.6	164 07.7 04.4	127 34.9 43.9	18 05.9 41.2	316 42.1 120 20 44.4 + 61					
2	259 04.4	239 02.5 34.8	179 08.3 04.5	142 36.9 43.8	33 08.6 41.2	331 13.1 121 20 38.3 + 63					
3	274 06.9	254 02.1 .. 35.9	194 09.0 .. 04.7	157 39.0 .. 43.7	48 11.2 .. 41.1	345 44.2 121 -20 32.0 + 63					
4	289 09.3	269 01.8 37.0	209 09.7 04.8	172 41.1 43.7	63 13.9 41.1	0 15.3 122 20 25.7 + 64					
5	304 11.8	284 01.4 38.1	224 10.3 04.9	187 43.1 43.6	78 16.5 41.0	14 46.5 122 20 19.3 + 66					
6	319 14.3	299 01.1 + 6 39.3	239 11.0 +24 05.0	202 45.2 +21 43.5	93 19.2 -14 41.0	29 17.7 122 -20 12.7 + 66					
7	334 16.7	314 00.7 40.4	254 11.6 05.2	217 47.3 43.5	108 21.8 40.9	43 48.9 122 20 06.1 + 67					
8	349 19.2	329 00.4 41.5	269 12.3 05.3	232 49.3 43.4	123 24.5 40.9	58 20.1 122 19 59.4 + 68					
9	4 21.7	344 00.0 .. 42.6	284 12.9 .. 05.4	247 51.4 .. 43.4	138 27.1 .. 40.8	72 51.3 123 -19 52.6 + 70					
10	19 24.1	358 59.7 43.8	299 13.6 05.5	262 53.5 43.3	153 29.8 40.8	87 22.6 123 19 45.6 + 70					
11	34 26.6	13 59.3 44.9	314 14.3 05.7	277 55.6 43.2	168 32.4 40.7	101 53.9 124 19 38.6 + 71					
12	49 29.1	28 59.0 + 6 46.0	329 14.9 +24 05.8	292 57.6 +21 43.2	183 35.1 -14 40.7	116 25.3 123 -19 31.5 + 72					
13	64 31.5	43 58.6 47.1	344 15.6 05.9	307 59.7 43.1	198 37.7 40.6	130 56.6 124 19 24.3 + 73					
14	79 34.0	58 58.3 48.3	359 16.2 06.0	323 01.8 43.0	213 40.4 40.6	145 28.0 125 19 17.0 + 73					
15	94 36.5	73 57.9 .. 49.4	14 16.9 .. 06.2	338 03.8 .. 43.0	228 43.0 .. 40.5	159 59.5 124 -19 09.7 + 75					
16	109 38.9	88 57.6 50.5	29 17.6 06.3	353 05.9 42.9	243 45.7 40.5	174 30.9 125 19 02.2 + 76					
17	124 41.4	103 57.2 51.6	44 18.2 06.4	8 08.0 42.8	258 48.4 40.4	189 02.4 125 18 54.6 + 76					
18	139 43.8	118 56.9 + 6 52.7	59 18.9 +24 06.5	23 10.0 +21 42.8	273 51.0 -14 40.4	203 33.9 125 -18 47.0 + 78					
19	154 46.3	133 56.5 53.9	74 19.5 06.7	38 12.1 42.7	288 53.7 40.3	218 05.4 126 18 39.2 + 78					
20	169 48.8	148 56.2 55.0	89 20.2 06.8	53 14.2 42.6	303 56.3 40.3	232 37.0 126 18 31.4 + 79					
21	184 51.2	163 55.8 .. 56.1	104 20.9 .. 06.9	68 16.2 .. 42.6	318 59.0 .. 40.2	247 08.6 126 -18 23.5 + 80					
22	199 53.7	178 55.5 57.2	119 21.5 07.0	83 18.3 42.5	334 01.6 40.2	261 40.2 126 18 15.5 + 81					
23	214 56.2	193 55.1 58.3	134 22.2 07.1	98 20.4 42.4	349 04.3 40.1	276 11.8 127 18 07.4 + 82					
24	229 58.6	208 54.8 + 6 59.5	149 22.8 +24 07.3	113 22.4 +21 42.4	4 06.9 -14 40.1	290 43.5 127 -17 59.2 + 83					
code	-	- 3 + 11	+ 7 + 1	+ 21 - 1	+ 26 + 1						

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.	No.	Name	SHA	Dec.				10	11	12	13	Alt.	Sun's Low'r Limb	Venus	Mars		
										h m	h m	h m	h m					°	'
10	0	180 54.4	+17 21.4	7	Acamar	315 51.7	-40 28.9	72	□	□	■	■	■	3 51	Alt.	Sun's	Venus	Mars	
	1	195 54.4	22.1	5	Achernar	335 59.6	-57 27.6	70	1 29	///	■	■	■	2 48	°	Low'r			
	2	210 54.4	22.8	30	Acrux	173 57.7	-62 51.5	68	2 12	///	■	■	2 33	2 11	Limb	Add	Add	Add	
	3	225 54.4	23.4	19	Adhara	255 47.0	-28 54.8	66	2 41	///	1 42	1 49	1 48	1 46	°				
	4	240 54.5	24.1	10	Aldebaran	291 39.7	+16 25.2	64	3 02	///	0 35	1 04	1 19	1 26	0	0.2	0.1	0.1	
	5	255 54.5	24.8					62	3 20	///	0 00	0 35	0 56	1 09	30	0.2	0.1	0.0	
	6	270 54.5	+17 25.4	32	Alioth	166 58.3	+56 12.1	60	3 34	///	24 12	0 12	0 38	0 55	45	0.2	0.1	0.0	
	7	285 54.6	26.1	34	Alkaid	153 32.6	+49 32.1	58	3 46	///	23 54	24 23	0 23	0 44	60	0.2	0.1	0.0	
	8	300 54.6	26.7	55	Al Na'ir	28 38.3	-47 10.4	56	3 56	///	23 39	24 10	0 10	0 33	75	0.2	0.0	0.0	
	9	315 54.6	27.4	15	Anilam	276 30.8	-1 13.8	54	4 06	0 31	23 25	23 58	24 24	0 24	90	0.2	0.0	0.0	
	10	330 54.7	28.1	25	Alphard	218 38.9	-8 28.1	52	4 14	1 21	23 14	23 48	24 16	0 16					
	11	345 54.7	28.7					50	4 21	1 50	23 04	23 39	24 09	0 09	Moon's Lower Limb				
	12	0 54.7	+17 29.4	41	Alphecca	126 47.5	+26 51.7	45	4 37	2 34	22 42	23 20	23 53	24 22	Add				
	13	15 54.7	30.1	1	Alpheratz	358 28.9	+28 50.6	40	4 49	3 03	22 25	23 05	23 40	24 12	Alt.	10	11	12	
	14	30 54.8	30.7	51	Altair	62 50.6	+8 44.9	35	5 00	3 24	22 10	22 52	23 29	24 04	°				
	15	45 54.8	31.4	2	Ankaa	353 58.8	-42 32.7	30	5 10	3 41	21 57	22 40	23 20	23 56	0	11.9	12.2	12.6	
	16	60 54.8	32.0	42	Antares	113 19.4	-26 20.2	20	5 26	4 07	21 36	22 21	23 03	23 43	4	11.9	12.3	12.7	
	17	75 54.9	32.7					10	5 40	4 26	21 17	22 03	22 49	23 32	8	11.9	12.3	12.7	
	18	90 54.9	+17 33.3	37	Arcturus	146 35.1	+19 24.7	0	5 53	4 41	20 59	21 47	22 35	23 21	12	11.9	12.3	12.7	
	19	105 54.9	34.0	43	Atria	108 59.8	-68 56.9	10	6 06	4 53	20 41	21 31	22 21	23 10	16	12.0	12.4	12.7	
	20	120 54.9	34.7	22	Avior	234 36.1	-59 22.3	20	6 19	5 03	20 22	21 14	22 06	22 59	20	12.1	12.4	12.8	
	21	135 55.0	35.3	13	Bellatrix	279 19.0	+6 18.6	30	6 35	5 12	20 00	20 54	21 49	22 46	24	12.2	12.5	12.9	
	22	150 55.0	36.0	16	Betel'ge	271 48.7	+7 24.0	35	6 44	5 16	19 48	20 43	21 40	22 38	28	12.2	12.6	12.9	
	23	165 55.0	36.6					40	6 54	5 20	19 33	20 29	21 28	22 29	32	12.4	12.7	13.0	
11	0	180 55.0	+17 37.3	17	Canopus	264 15.9	-52 40.5	45	7 06	5 24	19 15	20 13	21 15	22 19	36	12.5	12.8	13.1	
	1	195 55.1	37.9	12	Capella	281 39.3	+45 57.4	50	7 20	5 27	18 53	19 54	20 59	22 07	40	12.6	12.9	13.2	
	2	210 55.1	38.6	53	Deneb	50 01.1	+45 07.0	52	7 27	5 28	18 43	19 44	20 51	22 01	40	12.7	13.0	13.3	
	3	225 55.1	39.2	28	Denebola	183 17.8	+14 49.2	54	7 34	5 29	18 31	19 34	20 42	21 55	44	12.9	13.2	13.4	
	4	240 55.1	39.9	4	Diphda	349 39.8	-18 13.8	56	7 43	5 31	18 18	19 22	20 33	21 47	52	13.1	13.3	13.6	
	5	255 55.2	40.5					58	7 52	5 32	18 02	19 08	20 22	21 39	56	13.2	13.5	13.7	
	6	270 55.2	+17 41.2	27	Dubhe	194 44.6	+61 59.7	60	8 03	5 32	17 43	18 52	20 09	21 30	60	13.4	13.6	13.8	
	7	285 55.2	41.8	14	Elnath	279 08.0	+28 34.3								64	13.6	13.8	14.0	
	8	300 55.2	42.5	47	Eltanin	91 05.9	+51 29.4	Lat.		Sunset		Twlt. ends		Moonset					
	9	315 55.2	43.1	54	Enif	34 29.9	+9 40.1	N.	h m.	h m.	h m.	h m.	h m.	h m.	h m.	h m.	h m.		
	10	330 55.3	43.8	56	Fomalhaut	16 12.0	-29 51.4												
	11	345 55.3	44.4	31	Gacrux	172 49.2	-56 52.1	72	□	□	■	■	■	5 57	76	14.0	14.1	14.3	
	12	0 55.3	+17 45.1	29	Gienah	176 36.9	-17 17.9	70	22 31	///	■	■	■	7 00	80	14.2	14.3	14.4	
	13	15 55.3	45.7	35	Hadar	149 49.2	-60 09.8	68	21 45	///	■	■	5 36	7 34	84	14.4	14.5	14.6	
	14	30 55.4	46.4	6	Hamal	328 50.3	+23 15.1	66	21 15	///	3 03	4 38	6 19	7 59	88	14.6	14.7	14.8	
	15	45 55.4	47.0	48	Kaus Aust.	84 41.3	-34 24.4	64	20 53	///	4 10	5 22	6 48	8 19	90	14.7	14.8	14.9	
	16	60 55.4	47.7					62	20 35	///	4 45	5 52	7 10	8 34	Add to table, back cover				
	17	75 55.4	48.3	40	Kochab	137 16.6	+74 20.2	60	20 21	///	5 10	6 14	7 28	8 47	Moon's Upper Limb				
	18	90 55.4	+17 49.0	57	Markab	14 21.9	+14 57.8	58	20 08	///	5 30	6 32	7 43	8 58	Subtract				
	19	105 55.5	49.6	8	Menkar	315 00.9	+3 54.9	56	19 58	///	5 47	6 47	7 55	9 08	Alt.	10	11	12	
	20	120 55.5	50.3	36	Menkent	148 58.6	-36 09.3	54	19 48	23 37	6 01	7 00	8 06	9 16	°				
	21	135 55.5	50.9	24	Misap'dus	221 49.2	-69 32.4	52	19 40	22 37	6 13	7 11	8 16	9 24	0	17.7	17.4	17.2	
	22	150 55.5	51.5					50	19 33	22 08	6 24	7 21	8 24	9 31	4	17.6	17.4	17.2	
	23	165 55.5	52.2	9	Mirfak	309 43.3	+49 42.2	45	19 17	21 22	6 47	7 42	8 42	9 46	8	17.6	17.4	17.2	
12	0	180 55.6	+17 52.8	50	Nunki	76 52.0	-26 21.2	40	19 04	20 52	7 05	7 59	8 57	9 57	12	17.6	17.4	17.2	
	1	195 55.6	53.5	52	Peacock	54 27.5	-56 52.5	35	18 53	20 30	7 20	8 14	9 10	10 08	16	17.5	17.3	17.1	
	2	210 55.6	54.1	21	Pollux	244 21.1	+28 08.2	30	18 43	20 13	7 33	8 26	9 21	10 17	20	17.5	17.3	17.1	
	3	225 55.6	54.8	20	Procyon	245 45.4	+5 20.3	20	18 27	19 47	7 56	8 47	9 39	10 32	24	17.4	17.2	17.0	
	4	240 55.6	55.4					10	18 13	19 27	8 15	9 05	9 55	10 45	28	17.4	17.2	17.0	
	5	255 55.7	56.0	46	R'alhague	96 46.6	+12 35.3	0	18 00	19 12	8 34	9 22	10 10	10 57	32	17.3	17.1	16.9	
	6	270 55.7	+17 56.7	26	Regulus	208 29.8	+12 11.1	10	17 47	19 00	8 52	9 39	10 25	11 09	36	17.2	17.0	16.8	
	7	285 55.7	57.3	11	Rigel	281 54.2	-8 15.2	20	17 33	18 49	9 11	9 57	10 41	11 22	40	17.0	16.9	16.7	
	8	300 55.7	57.9	38	Rigel Kent.	140 50.7	-60 39.4	30	17 18	18 40	9 33	10 18	11 00	11 37	44	16.9	16.8	16.6	
	9	315 55.7	58.6	44	Sabik	103 02.2	-15 40.3	35	17 09	18 36	9 46	10 30	11 10	11 46	48	16.8	16.6	16.5	
	10	330 55.7	59.2					40	16 58	18 31	10 01	10 44	11 22	11 56	52	16.6	16.5	16.4	
	11	345 55.8	17 59.9	3	Schedar	350 30.8	+56 17.4	45	16 47	18 28	10 19	11 01	11 36	12 07	56	16.5	16.4	16.3	
	12	0 55.8	+18 00.5	45	Shaula	97 20.7	-37 04.4	50	16 32	18 24	10 41	11 21	11 54	12 20	60	16.3	16.2	16.1	
	13	15 55.8	01.1	18	Sirius	259 12.3	-16 39.4	52	16 25	18 22	10 52	11 31	12 02	12 27	60	16.1	16.1	16.0	
	14	30 55.8	01.8	33	Spica	159 16.9	-10 55.9	54	16 18	18 22	11 04	11 42	12 11	12 34	64	15.9	15.9	15.9	
	15	45 55.8	02.4	23	Suhail	223 24.6	-43 15.5	56	16 10	18 21	11 17	11 53	12 21	12 42	68	15.8	15.7	15.7	
	16	60 55.8	03.0					58	16 00	18 19	11 33	12 08	12 32	12 50	72	15.6	15.6	15.6	
	17	75 55.9	03.7	49	Vega	81 08.2	+38 44.3	60	15 49	18 17	11 53	12 24	12 45	13 00	76	15.4	15.4	15.4	
	18	90 55.9	+18 04.3	39	Zub'g'bi	137 53.3	-15 51.6								80	15.2	15.2	15.2	
	19	105 55.9	04.9	G M T				Equation of Time (App.—Mean)				GMT of Transit Mendion of Greenwich				88 90	Subtract from table, back cover		
	20	120 55.9	05.6					10 11 12				DAY Moon Venus Mars Jupiter Saturn							
	21	135 55.9	06.2	h m s m s m s				10 11 12				h m h m h m h m h m							
	22	150 55.9	06.8	0 + 3 37.4 + 3 40.1 + 3 42.2				10				2 22 10 03 14 05 16 34 23 52							
	23	165 55.9	07.5	6 + 3 38.1 + 3 40.7 + 3 42.7				11				3 11 10 04 14 04 16 31 23 48							
24	180 55.9	+18 08.1	12 + 3 38.8 + 3 41.2 + 3																

G M T	VENUS -3.3		MARS 1.9		JUPITER -1.6		SATURN 0.3		MOON		
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	code
13 0	229 58.6	208 54.8 + 6 59.5	149 22.8 +24 07.3	113 22.4 +21 42.4	4 06.9 -14 40.1	290 43.5 127 -17 59.2 + 83					
1 1	245 01.1	223 54.4 7 00.6	164 23.5 07.4	128 24.5 42.3	19 09.6 40.0	305 15.2 127 17 50.9 + 84					
2 2	260 03.6	238 54.1 01.7	179 24.2 07.5	143 26.6 42.2	34 12.2 40.0	319 46.9 128 17 42.5 + 84					
3 3	275 06.0	253 53.7 .. 02.8	194 24.8 .. 07.6	158 28.6 .. 42.2	49 14.9 .. 39.9	334 18.7 127 -17 34.1 + 85					
4 4	290 08.5	268 53.4 04.0	209 25.5 07.7	173 30.7 42.1	64 17.5 39.9	348 50.4 128 17 25.6 + 86					
5 5	305 11.0	283 53.0 05.1	224 26.1 07.8	188 32.7 42.0	79 20.2 39.8	3 22.2 128 17 17.0 + 87					
6 6	320 13.4	298 52.7 + 7 06.2	239 26.8 +24 08.0	203 34.8 +21 42.0	94 22.8 -14 39.8	17 54.0 129 -17 08.3 + 88					
7 7	335 15.9	313 52.3 07.3	254 27.4 08.1	218 36.9 41.9	109 25.5 39.7	32 25.9 129 16 59.5 + 89					
8 8	350 18.3	328 51.9 08.4	269 28.1 08.2	233 38.9 41.8	124 28.1 39.7	46 57.8 129 16 50.6 + 89					
9 9	5 20.8	343 51.6 .. 09.5	284 28.8 .. 08.3	248 41.0 .. 41.8	139 30.8 .. 39.6	61 29.7 129 -16 41.7 + 91					
10 10	20 23.3	358 51.2 10.7	299 29.4 08.4	263 43.1 41.7	154 33.4 39.6	76 01.6 129 16 32.6 + 91					
11 11	35 25.7	13 50.9 11.8	314 30.1 08.6	278 45.1 41.6	169 36.1 39.5	90 33.5 130 16 23.5 + 92					
12 12	50 28.2	28 50.5 + 7 12.9	329 30.7 +24 08.7	293 47.2 +21 41.6	184 38.7 -14 39.5	105 05.5 130 -16 14.3 + 92					
13 13	65 30.7	43 50.2 14.0	344 31.4 08.8	308 49.3 41.5	199 41.4 39.4	119 37.5 130 16 05.1 + 94					
14 14	80 33.1	58 49.8 15.1	359 32.1 08.9	323 51.3 41.4	214 44.0 39.4	134 09.5 130 15 55.7 + 94					
15 15	95 35.6	73 49.5 .. 16.3	14 32.7 .. 09.0	338 53.4 .. 41.4	229 46.7 .. 39.3	148 41.5 131 -15 46.3 + 95					
16 16	110 38.1	88 49.1 17.4	29 33.4 09.1	353 55.5 41.3	244 49.3 39.3	163 13.6 130 15 36.8 + 96					
17 17	125 40.5	103 48.8 18.5	44 34.0 09.2	8 57.5 41.2	259 52.0 39.2	177 45.6 131 15 27.2 + 97					
18 18	140 43.0	118 48.4 + 7 19.6	59 34.7 +24 09.4	23 59.6 +21 41.2	274 54.6 -14 39.2	192 17.7 131 -15 17.5 + 97					
19 19	155 45.4	133 48.0 20.7	74 35.4 09.5	39 01.6 41.1	289 57.3 39.1	206 49.8 132 15 07.8 + 98					
20 20	170 47.9	148 47.7 21.8	89 36.0 09.6	54 03.7 41.0	304 59.9 39.1	221 22.0 131 14 58.0 + 99					
21 21	185 50.4	163 47.3 .. 23.0	104 36.7 .. 09.7	69 05.8 .. 41.0	320 02.6 .. 39.0	235 54.1 132 -14 48.1 +100					
22 22	200 52.8	178 47.0 24.1	119 37.3 09.8	84 07.8 40.9	335 05.2 39.0	250 26.3 132 14 38.1 +101					
23 23	215 55.3	193 46.6 25.2	134 38.0 09.9	99 09.9 40.8	350 07.9 38.9	264 58.5 132 14 28.0 +101					
14 0	230 57.8	208 46.3 + 7 26.3	149 38.7 +24 10.0	114 11.9 +21 40.8	5 10.5 -14 38.9	279 30.7 132 -14 17.9 +102					
1 1	246 00.2	223 45.9 27.4	164 39.3 10.1	129 14.0 40.7	20 13.2 38.8	294 02.9 133 14 07.7 +102					
2 2	261 02.7	238 45.5 28.5	179 40.0 10.2	144 16.1 40.6	35 15.8 38.8	308 35.2 132 13 57.5 +104					
3 3	276 05.2	253 45.2 .. 29.6	194 40.6 .. 10.4	159 18.1 .. 40.6	50 18.5 .. 38.7	323 07.4 133 -13 47.1 +104					
4 4	291 07.6	268 44.8 30.8	209 41.3 10.5	174 20.2 40.5	65 21.1 38.7	337 39.7 133 13 36.7 +104					
5 5	306 10.1	283 44.5 31.9	224 42.0 10.6	189 22.2 40.4	80 23.8 38.6	352 12.0 133 13 26.3 +106					
6 6	321 12.6	298 44.1 + 7 33.0	239 42.6 +24 10.7	204 24.3 +21 40.4	95 26.4 -14 38.6	6 44.3 133 -13 15.7 +106					
7 7	336 15.0	313 43.7 34.1	254 43.3 10.8	219 26.4 40.3	110 29.1 38.6	21 16.6 133 13 05.1 +107					
8 8	351 17.5	328 43.4 35.2	269 43.9 10.9	234 28.4 40.2	125 31.7 38.5	35 48.9 134 12 54.4 +108					
9 9	6 19.9	343 43.0 .. 36.3	284 44.6 .. 11.0	249 30.5 .. 40.2	140 34.4 .. 38.5	50 21.3 133 -12 43.6 +108					
10 10	21 22.4	358 42.7 37.4	299 45.3 11.1	264 32.5 40.1	155 37.0 38.4	64 53.6 134 12 32.8 +109					
11 11	36 24.9	13 42.3 38.6	314 45.9 11.2	279 34.6 40.0	170 39.7 38.4	79 26.0 134 12 21.9 +109					
12 12	51 27.3	28 41.9 + 7 39.7	329 46.6 +24 11.3	294 36.7 +21 39.9	185 42.3 -14 38.3	93 58.4 133 -12 11.0 +110					
13 13	66 29.8	43 41.6 40.8	344 47.2 11.4	309 38.7 39.9	200 45.0 38.3	108 30.7 134 12 00.0 +111					
14 14	81 32.3	58 41.2 41.9	359 47.9 11.5	324 40.8 39.8	215 47.6 38.2	123 03.1 134 11 48.9 +112					
15 15	96 34.7	73 40.9 .. 43.0	14 48.5 .. 11.7	339 42.8 .. 39.7	230 50.3 .. 38.2	137 35.5 135 -11 37.7 +112					
16 16	111 37.2	88 40.5 44.1	29 49.2 11.8	354 44.9 39.7	245 52.9 38.1	152 08.0 134 11 26.5 +113					
17 17	126 39.7	103 40.1 45.2	44 49.9 11.9	9 47.0 39.6	260 55.6 38.1	166 40.4 134 11 15.2 +113					
18 18	141 42.1	118 39.8 + 7 46.3	59 50.5 +24 12.0	24 49.0 +21 39.5	275 58.2 -14 38.0	181 12.8 134 -11 03.9 +114					
19 19	156 44.6	133 39.4 47.4	74 51.2 12.1	39 51.1 39.5	291 00.9 38.0	195 45.2 135 10 52.5 +115					
20 20	171 47.1	148 39.0 48.6	89 51.8 12.2	54 53.1 39.4	306 03.5 37.9	210 17.7 134 10 41.0 +115					
21 21	186 49.5	163 38.7 .. 49.7	104 52.5 .. 12.3	69 55.2 .. 39.3	321 06.2 .. 37.9	224 50.1 134 -10 29.5 +116					
22 22	201 52.0	178 38.3 50.8	119 53.2 12.4	84 57.2 39.3	336 08.8 37.8	239 22.5 135 10 17.9 +116					
23 23	216 54.4	193 38.0 51.9	134 53.8 12.5	99 59.3 39.2	351 11.5 37.8	253 55.0 134 10 06.3 +118					
15 0	231 56.9	208 37.6 + 7 53.0	149 54.5 +24 12.6	115 01.4 +21 39.1	6 14.1 -14 37.7	268 27.4 135 - 9 54.5 +117					
1 1	246 59.4	223 37.2 54.1	164 55.1 12.7	130 03.4 39.1	21 16.8 37.7	282 59.9 134 9 42.8 +118					
2 2	262 01.8	238 36.9 .. 55.2	179 55.8 12.8	145 05.5 39.0	36 19.4 37.6	297 32.3 135 9 31.0 +119					
3 3	277 04.3	253 36.5 .. 56.3	194 56.5 .. 12.9	160 07.5 .. 38.9	51 22.1 .. 37.6	312 04.8 134 - 9 19.1 +119					
4 4	292 06.8	268 36.1 57.4	209 57.1 13.0	175 09.6 38.9	66 24.7 37.5	326 37.2 135 9 07.2 +120					
5 5	307 09.2	283 35.8 58.5	224 57.8 13.1	190 11.6 38.8	81 27.4 37.5	341 09.7 134 8 55.2 +121					
6 6	322 11.7	298 35.4 + 7 59.7	239 58.4 +24 13.2	205 13.7 +21 38.7	96 30.0 -14 37.4	355 42.1 135 - 8 43.1 +121					
7 7	337 14.2	313 35.0 8 00.8	254 59.1 13.3	220 15.7 38.6	111 32.7 37.4	10 14.6 134 8 31.0 +121					
8 8	352 16.6	328 34.7 01.9	269 59.8 13.4	235 17.8 38.6	126 35.3 37.3	24 47.0 134 8 18.9 +122					
9 9	7 19.1	343 34.3 .. 03.0	285 00.4 .. 13.5	250 19.9 .. 38.5	141 38.0 .. 37.3	39 19.4 134 - 8 06.7 +123					
10 10	22 21.6	358 33.9 04.1	300 01.1 13.6	265 21.9 38.4	156 40.6 37.2	53 51.8 135 7 54.4 +123					
11 11	37 24.0	13 33.6 05.2	315 01.7 13.7	280 24.0 38.4	171 43.3 37.2	68 24.3 134 7 42.1 +123					
12 12	52 26.5	28 33.2 + 8 06.3	330 02.4 +24 13.8	295 26.0 +21 38.3	186 45.9 -14 37.1	82 56.7 134 - 7 29.8 +124					
13 13	67 28.9	43 32.8 07.4	345 03.0 13.9	310 28.1 38.2	201 48.6 37.1	97 29.1 133 7 17.4 +125					
14 14	82 31.4	58 32.5 08.5	0 03.7 14.0	325 30.1 38.2	216 51.2 37.0	112 01.4 134 7 04.9 +125					
15 15	97 33.9	73 32.1 .. 09.6	15 04.4 .. 14.1	340 32.2 .. 38.1	231 53.9 .. 37.0	126 33.8 134 - 6 52.4 +125					
16 16	112 36.3	88 31.7 10.7	30 05.0 14.2	355 34.2 38.0	246 56.5 36.9	141 06.2 133 6 39.9 +126					
17 17	127 38.8	103 31.4 11.8	45 05.7 14.3	10 36.3 38.0	261 59.2 36.9	155 38.5 134 6 27.3 +127					
18 18	142 41.3	118 31.0 + 8 12.9	60 06.3 +24 14.4	25 38.3 +21 37.9	277 01.8 -14 36.8	170 10.9 133 - 6 14.6 +126					
19 19	157 43.7	133 30.6 14.0	75 07.0 14.5	40 40.4 37.8	292 04.5 36.8	184 43.2 133 6 02.0 +128					
20 20	172 46.2	148 30.2 15.1	90 07.7 14.6	55 42.4 37.7	307 07.1 36.7	199 15.5 133 5 49.2 +127					
21 21	187 48.7	163 29.9 .. 16.2	105 08.3 .. 14.7	70 44.5 .. 37.7	322 09.8 .. 36.7	213 47.8 133 - 5 36.5 +129					
22 22	202 51.1	178 29.5 17.3	120 09.0 14.8	85 46.6 37.6	337 12.4 36.6	228 20.1 132 5 23.6 +128					
23 23	217 53.6	193 29.1 18.4	135 09.6 14.9	100 48.6 37.5	352 15.1 36.6	242 52.3 133 5 10.8 +129					
24	232 56.0	208 28.8 + 8 19.5	150 10.3 +24 15.0	115 50.7 +21 37.5	7 17.7 -14 36.5	257 24.6 132 - 4 57.9 +129					
code	-	- 3 + 11	+ 6 + 1	+ 20 0	+ 27 0						

G M T	SUN			STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS				
	GHA	Dec.	No.	Name	SHA	Dec.													
							13				14	15	16	Alt.	Sun's Low'r Limb	Venus	Mars		
h	°	'	°	'	°	'	N	h	m	h	m	h	m	h	m	°	'	'	'
13	0	180 55.9	+18 08.1	7	Acamar	315 51.7	-40 28.9	72	□	□	3 51	2 46	2 16	1 52	Alt.				
1	1	195 56.0	08.7	5	Achernar	335 59.5	-57 27.6	70	1 01	///	2 48	2 19	2 01	1 46					
2	2	210 56.0	09.3	30	Acrux	173 57.7	-62 51.5	68	1 57	///	2 11	1 59	1 49	1 41		Add	Add	Add	Add
3	3	225 56.0	10.0	19	Adhara	255 47.0	-28 54.8	66	2 29	///	1 46	1 43	1 40	1 36	°	'	'	'	'
4	4	240 56.0	10.6	10	Aldebaran	291 39.7	+16 25.2	64	2 53	///	1 26	1 29	1 31	1 33	30	0.2	0.1	0.1	0.1
5	5	255 56.0	11.2					62	3 11	///	1 09	1 18	1 24	1 29	40	0.2	0.1	0.0	0.0
6	6	270 56.0	+18 11.9	32	Alioth	166 58.3	+56 12.1	60	3 27	///	0 55	1 08	1 18	1 27	45	0.2	0.1	0.0	0.0
7	7	285 56.0	12.5	34	Alkaid	153 32.6	+49 32.1	58	3 39	///	0 44	1 00	1 13	1 24	60	0.2	0.0	0.0	0.0
8	8	300 56.0	13.1	55	Al Na'ir	28 38.3	-47 10.4	56	3 50	///	0 33	0 52	1 08	1 22	75	0.2	0.0	0.0	0.0
9	9	315 56.1	13.7	15	Alnilam	276 30.8	-1 13.8	54	4 00	///	0 24	0 46	1 03	1 20	90				
10	10	330 56.1	14.4	25	Alphard	218 38.9	-8 28.1	52	4 09	1 06	0 16	0 40	0 59	1 18	Moon's Lower Limb				
11	11	345 56.1	15.0					50	4 17	1 39	0 09	0 34	0 56	1 16	Add				
12	12	0 56.1	+18 15.6	41	Alphecca	126 47.5	+26 51.7	45	4 33	2 27	24 22	0 22	0 48	1 12	Alt.	13	14	15	
13	13	15 56.1	16.2	1	Alpheratz	358 28.9	+28 50.6	40	4 46	2 57	24 12	0 12	0 41	1 09	°	'	'	'	'
14	14	30 56.1	16.8	51	Altair	62 50.5	+8 44.9	35	4 58	3 21	24 04	0 04	0 36	1 06	4	13.3	14.2	15.2	
15	15	45 56.1	17.5	2	Ankaa	353 58.8	-42 32.7	30	5 08	3 38	23 56	24 31	0 31	1 04	8	13.3	14.2	15.2	
16	16	60 56.1	18.1	42	Antares	113 19.3	-26 20.2	20	5 25	4 05	23 43	24 22	0 22	1 00	12	13.3	14.2	15.2	
17	17	75 56.1	18.7					10	5 39	4 24	23 32	24 14	0 14	0 56	16	13.3	14.2	15.2	
18	18	90 56.1	+18 19.3	37	Arcturus	146 35.1	+19 24.7	0	5 53	4 40	23 21	24 07	0 07	0 53	20	13.3	14.2	15.2	
19	19	105 56.1	19.9	43	Atria	108 59.8	-68 56.9	10	6 06	4 53	23 10	24 00	0 00	0 49	24	13.4	14.2	15.2	
20	20	120 56.2	20.6	22	Avior	234 36.1	-59 22.3	20	6 20	5 04	22 59	23 52	24 45	0 45	28	13.4	14.2	15.2	
21	21	135 56.2	21.2	13	Bellatrix	279 19.0	+6 18.6	30	6 37	5 14	22 46	23 43	24 41	0 41	32	13.4	14.2	15.2	
22	22	150 56.2	21.8	16	Betelge'se	271 48.7	+7 24.0	35	6 46	5 18	22 38	23 38	24 39	0 39	36	13.4	14.3	15.2	
23	23	165 56.2	22.4					40	6 57	5 22	22 29	23 32	24 36	0 36	40	13.5	14.3	15.2	
				17	Canopus	264 15.9	-52 40.5	45	7 09	5 26	22 19	23 25	24 33	0 33	44	13.6	14.3	15.2	
14	0	180 56.2	+18 23.0	12	Capella	281 39.3	+45 57.3	50	7 24	5 30	22 07	23 17	24 29	0 29	48	13.6	14.4	15.2	
1	1	195 56.2	23.7	53	Deneb	50 01.1	+45 07.0	52	7 31	5 32	22 01	23 13	24 27	0 27	52	13.7	14.4	15.2	
2	2	210 56.2	24.3	28	Denebola	183 17.8	+14 49.2	54	7 39	5 34	21 55	23 09	24 25	0 25	56	13.8	14.5	15.3	
3	3	225 56.2	24.9	4	Diphda	349 39.8	-18 13.8	56	7 48	5 35	21 47	23 04	24 23	0 23	60	13.9	14.5	15.3	
4	4	240 56.2	25.5					58	7 58	5 36	21 39	22 59	24 21	0 21	64	14.0	14.6	15.3	
5	5	255 56.2	26.1	27	Dubhe	194 44.6	+61 59.7	60	8 09	5 38	21 30	22 53	24 18	0 18	68	14.1	14.7	15.3	
6	6	270 56.2	+18 26.7	14	Elnath	279 08.0	+28 34.3	Lat.	Sunset	Twlt. ends	Moonset				72	14.2	14.7	15.3	
7	7	285 56.2	27.3	47	Eltanin	91 05.9	+51 29.4	N	h	m	h	m	h	m	h	m	h	m	
8	8	300 56.2	28.0	54	Enif	34 29.9	+9 40.1	72	□	□	5 57	8 39	10 45	12 46	76	14.3	14.8	15.3	
9	9	315 56.2	28.6	56	Fomalhaut	16 12.0	-29 51.4	70	23 02	///	7 00	9 04	10 57	12 49	80	14.4	14.9	15.4	
10	10	330 56.2	29.2					68	22 01	///	7 34	9 23	11 07	12 52	84	14.6	14.9	15.4	
11	11	345 56.2	29.8	31	Gacrux	172 49.2	-56 52.2	66	21 27	///	7 59	9 38	11 15	12 54	88	14.7	15.0	15.4	
12	12	0 56.2	+18 30.4	29	Gienah	176 36.9	-17 17.9	64	21 02	///	8 19	9 50	11 22	12 56	92	14.8	15.1	15.4	
13	13	15 56.2	31.0	35	Hadar	149 49.2	-60 09.8	62	20 43	///	8 34	10 00	11 28	12 57		15.0	15.2	15.5	
14	14	30 56.2	31.6	6	Hamal	328 50.3	+23 15.1	60	20 28	///	8 47	10 09	11 33	12 59	Add to table, back cover				
15	15	45 56.3	32.2	48	Kaus Aust.	84 41.2	-34 24.4	58	20 15	///	8 58	10 17	11 37	13 00	Moon's Upper Limb				
16	16	60 56.3	32.8					56	20 03	///	9 08	10 24	11 41	13 01	Subtract				
17	17	75 56.3	33.4	40	Kochab	137 16.7	+74 20.3	54	19 54	///	9 16	10 30	11 45	13 02	Alt.	13	14	15	
18	18	90 56.3	+18 34.0	57	Markab	14 21.8	+14 57.8	52	19 45	22 53	9 24	10 35	11 48	13 03	°	'	'	'	'
19	19	105 56.3	34.7	8	Menkar	315 00.9	+3 54.9	50	19 37	22 18	9 31	10 40	11 51	13 04	4	16.9	16.4	15.8	
20	20	120 56.3	35.3	36	Menkent	148 58.6	-36 09.3	45	19 20	21 28	9 46	10 51	11 57	13 06	8	16.8	16.3	15.8	
21	21	135 56.3	35.9	24	Miapl'dus	221 49.3	-69 32.4	40	19 07	20 57	9 57	10 59	12 02	13 07	12	16.8	16.3	15.8	
22	22	150 56.3	36.5					35	18 55	20 33	10 08	11 07	12 07	13 08	16	16.8	16.3	15.8	
23	23	165 56.3	37.1	50	Nunki	76 52.0	-26 21.2	30	18 45	20 15	10 17	11 13	12 11	13 10	20	16.8	16.3	15.8	
				20	Procyon	245 45.4	+5 20.3	20	18 28	19 48	10 32	11 24	12 17	13 11	24	16.7	16.3	15.7	
15	0	180 56.3	+18 37.7	10				10	18 14	19 29	10 45	11 34	12 23	13 13	28	16.7	16.2	15.7	
1	1	195 56.3	38.3					0	18 00	19 13	10 57	11 43	12 29	13 15	32	16.6	16.2	15.7	
2	2	210 56.3	38.9	46	R'alhague	96 46.6	+12 35.3	10	17 46	18 59	11 09	11 52	12 34	13 16	36	16.6	16.2	15.7	
3	3	225 56.3	39.5	26	Regulus	208 29.8	+12 11.1	20	17 32	18 48	11 22	12 02	12 40	13 18	40	16.5	16.1	15.7	
4	4	240 56.3	40.1	11	Rigel	281 54.2	-8 15.2	30	17 16	18 39	11 37	12 13	12 46	13 19	44	16.4	16.1	15.7	
5	5	255 56.3	40.7	38	Rigel Kent.	140 50.7	-60 39.4	35	17 06	18 33	11 46	12 19	12 50	13 20	48	16.3	16.0	15.7	
6	6	270 56.3	+18 41.3	44	Sabik	103 02.2	-15 40.3	40	16 56	18 30	11 56	12 26	12 54	13 21	52	16.2	16.0	15.7	
7	7	285 56.3	41.9					45	16 43	18 25	12 07	12 34	12 59	13 23	56	16.1	15.9	15.6	
8	8	300 56.3	42.5	3	Schedar	350 30.7	+56 17.4	50	16 28	18 21	12 20	12 44	13 04	13 24	60	16.0	15.8	15.6	
9	9	315 56.3	43.1	45	Shaula	97 20.7	-37 04.4	52	16 21	18 19	12 27	12 48	13 07	13 25	64	15.9	15.7	15.6	
10	10	330 56.3	43.7	18	Sirius	259 12.3	-16 39												

G M T	VENUS — 3.3		MARS 1.9		JUPITER — 1.5		SATURN 0.3		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
h	°	°	°	°	°	°	°	°	°	°	°	°
16	0	232 56.0	208 28.8 + 8 19.5	150 10.3 +24 15.0	115 50.7 +21 37.5	7 17.7 -14 36.5	257 24.6 132 -	4 57.9 +129				
1	247 58.5	223 28.4 20.6	165 11.0 15.1	130 52.7 37.4	22 20.4 36.5	271 56.8 132	4 45.0 +130					
2	263 01.0	238 28.0 21.8	180 11.6 15.1	145 54.8 37.3	37 23.0 36.4	286 29.0 131	4 32.0 +130					
3	278 03.4	253 27.7 .. 22.9	195 12.3 .. 15.2	160 56.8 .. 37.3	52 25.7 .. 36.4	301 01.1 132	4 19.0 +131					
4	293 05.9	268 27.3 24.0	210 12.9 15.3	175 58.9 37.2	67 28.3 36.3	315 33.3 131	4 05.9 +131					
5	308 08.4	283 26.9 25.1	225 13.6 15.4	191 00.9 37.1	82 31.0 36.3	330 05.4 131	3 52.8 +131					
6	323 10.8	298 26.5 + 8 26.2	240 14.3 +24 15.5	206 03.0 +21 37.0	97 33.6 -14 36.2	344 37.5 131 -	3 39.7 +131					
7	338 13.3	313 26.2 27.3	255 14.9 15.6	221 05.0 37.0	112 36.3 36.2	359 09.6 130	3 26.6 +132					
8	353 15.8	328 25.8 28.4	270 15.6 15.7	236 07.1 36.9	127 38.9 36.1	13 41.6 131	3 13.4 +133					
9	8 18.2	343 25.4 .. 29.5	285 16.2 .. 15.8	251 09.1 .. 36.8	142 41.6 .. 36.1	28 13.7 129	3 00.1 +132					
10	23 20.7	358 25.0 30.6	300 16.9 15.9	266 11.2 36.8	157 44.2 36.0	42 45.6 130	2 46.9 +133					
11	38 23.2	13 24.7 31.7	315 17.5 16.0	281 13.2 36.7	172 46.9 36.0	57 17.6 129	2 33.6 +133					
12	53 25.6	28 24.3 + 8 32.8	330 18.2 +24 16.1	296 15.3 +21 36.6	187 49.5 -14 35.9	71 49.5 129 -	2 20.3 +134					
13	68 28.1	43 23.9 33.9	345 18.9 16.2	311 17.3 36.6	202 52.2 35.9	86 21.4 129	2 06.9 +134					
14	83 30.5	58 23.5 35.0	0 19.5 16.2	326 19.4 36.5	217 54.8 35.8	100 53.3 128	1 53.5 +134					
15	98 33.0	73 23.2 .. 36.1	15 20.2 .. 16.3	341 21.4 .. 36.4	232 57.5 .. 35.8	115 25.1 128	1 40.1 +134					
16	113 35.5	88 22.8 37.2	30 20.8 16.4	356 23.5 36.3	248 00.1 35.7	129 56.9 127	1 26.7 +134					
17	128 37.9	103 22.4 38.3	45 21.5 16.5	11 25.5 36.3	263 02.8 35.7	144 28.6 128	1 13.3 +135					
18	143 40.4	118 22.0 + 8 39.4	60 22.2 +24 16.6	26 27.6 +21 36.2	278 05.4 -14 35.6	159 00.4 126 -	0 59.8 +135					
19	158 42.9	133 21.7 40.5	75 22.8 16.7	41 29.6 36.1	293 08.1 35.6	173 32.0 127	0 46.3 +136					
20	173 45.3	148 21.3 41.5	90 23.5 16.8	56 31.7 36.1	308 10.7 35.6	188 03.7 126	0 32.7 +135					
21	188 47.8	163 20.9 .. 42.6	105 24.1 .. 16.9	71 33.7 .. 36.0	323 13.4 .. 35.5	202 35.3 125	0 19.2 +136					
22	203 50.3	178 20.5 43.7	120 24.8 17.0	86 35.8 35.9	338 16.0 35.5	217 06.8 125 -	0 05.6 +136					
23	218 52.7	193 20.2 44.8	135 25.5 17.0	101 37.8 35.9	353 18.6 35.4	231 38.3 125 +	0 08.0 +136					
17	0	233 55.2	208 19.8 + 8 45.9	150 26.1 +24 17.1	116 39.8 +21 35.8	8 21.3 -14 35.4	246 09.8 124 +	0 21.6 +136				
1	248 57.6	223 19.4 47.0	165 26.8 17.2	131 41.9 35.7	23 23.9 35.3	260 41.2 124	0 35.2 +136					
2	264 00.1	238 19.0 48.1	180 27.4 17.3	146 43.9 35.6	38 26.6 35.3	275 12.6 123	0 48.8 +137					
3	279 02.6	253 18.7 .. 49.2	195 28.1 .. 17.4	161 46.0 .. 35.6	53 29.2 .. 35.2	289 43.9 123	1 02.5 +137					
4	294 05.0	268 18.3 50.3	210 28.8 17.5	176 48.0 35.5	68 31.9 35.2	304 15.2 122	1 16.2 +137					
5	309 07.5	283 17.9 51.4	225 29.4 17.6	191 50.1 35.4	83 34.5 35.1	318 46.4 122	1 29.9 +137					
6	324 10.0	298 17.5 + 8 52.5	240 30.1 +24 17.6	206 52.1 +21 35.4	98 37.2 -14 35.1	333 17.6 121 +	1 43.6 +137					
7	339 12.4	313 17.1 53.6	255 30.7 17.7	221 54.2 35.3	113 39.8 35.0	347 48.7 121	1 57.3 +137					
8	354 14.9	328 16.8 54.7	270 31.4 17.8	236 56.2 35.2	128 42.5 35.0	2 19.8 120	2 11.0 +137					
9	9 17.4	343 16.4 .. 55.8	285 32.1 .. 17.9	251 58.3 .. 35.1	143 45.1 .. 34.9	16 50.8 119	2 24.7 +137					
10	24 19.8	358 16.0 56.9	300 32.7 18.0	267 00.3 35.1	158 47.8 34.9	31 21.7 119	2 38.4 +138					
11	39 22.3	13 15.6 58.0	315 33.4 18.1	282 02.4 35.0	173 50.4 34.8	45 52.6 119	2 52.2 +137					
12	54 24.8	28 15.2 + 8 59.1	330 34.0 +24 18.1	297 04.4 +21 34.9	188 53.1 -14 34.8	60 23.5 118 +	3 05.9 +138					
13	69 27.2	43 14.9 9 00.2	345 34.7 .. 18.2	312 06.4 34.9	203 55.7 34.7	74 54.3 117	3 19.7 +137					
14	84 29.7	58 14.5 01.3	0 35.3 18.3	327 08.5 34.8	218 58.4 34.7	89 25.0 117	3 33.4 +138					
15	99 32.1	73 14.1 .. 02.3	15 36.0 .. 18.4	342 10.5 .. 34.7	234 01.0 .. 34.6	103 55.7 116	3 47.2 +137					
16	114 34.6	88 13.7 03.4	30 36.7 18.5	357 12.6 34.6	249 03.7 34.6	118 26.3 115	4 00.9 +138					
17	129 37.1	103 13.3 04.5	45 37.3 18.5	12 14.6 34.6	264 06.3 34.5	132 56.8 115	4 14.7 +137					
18	144 39.5	118 12.9 + 9 05.6	60 38.0 +24 18.6	27 16.7 +21 34.5	279 09.0 -14 34.5	147 27.3 114 +	4 28.4 +138					
19	159 42.0	133 12.6 06.7	75 38.6 18.7	42 18.7 34.4	294 11.6 34.4	161 57.7 113	4 42.2 +137					
20	174 44.5	148 12.2 07.8	90 39.3 18.8	57 20.8 34.4	309 14.3 34.4	176 28.0 113	4 55.9 +137					
21	189 46.9	163 11.8 .. 08.9	105 40.0 .. 18.9	72 22.8 .. 34.3	324 16.9 .. 34.3	190 58.3 112	5 09.6 +138					
22	204 49.4	178 11.4 10.0	120 40.6 18.9	87 24.8 34.2	339 19.6 34.3	205 28.5 112	5 23.4 +137					
23	219 51.9	193 11.0 11.1	135 41.3 19.0	102 26.9 34.1	354 22.2 34.2	219 58.7 110	5 37.1 +137					
18	0	234 54.3	208 10.6 + 9 12.2	150 41.9 +24 19.1	117 28.9 +21 34.1	9 24.9 -14 34.2	234 28.7 110 +	5 50.8 +137				
1	249 56.8	223 10.3 13.2	165 42.6 19.2	132 31.0 34.0	24 27.5 34.1	248 58.7 110	6 04.5 +136					
2	264 59.3	238 09.9 14.3	180 43.3 19.2	147 33.0 33.9	39 30.2 34.1	263 28.7 108	6 18.1 +137					
3	280 01.7	253 09.5 .. 15.4	195 43.9 .. 19.3	162 35.1 .. 33.8	54 32.8 .. 34.0	277 58.5 108	6 31.8 +136					
4	295 04.2	268 09.1 16.5	210 44.6 19.4	177 37.1 33.8	69 35.4 34.0	292 28.3 107	6 45.4 +137					
5	310 06.6	283 08.7 17.6	225 45.2 19.5	192 39.1 33.7	84 38.1 33.9	306 58.0 106	6 59.1 +136					
6	325 09.1	298 08.3 + 9 18.7	240 45.9 +24 19.5	207 41.2 +21 33.6	99 40.7 -14 33.9	321 27.6 105 +	7 12.7 +136					
7	340 11.6	313 07.9 19.8	255 46.6 19.6	222 43.2 33.6	114 43.4 33.9	335 57.1 105	7 26.3 +135					
8	355 14.0	328 07.5 20.9	270 47.2 19.7	237 45.3 33.5	129 46.0 33.8	350 26.6 104	7 39.8 +136					
9	10 16.5	343 07.2 .. 21.9	285 47.9 .. 19.8	252 47.3 .. 33.4	144 48.7 .. 33.8	4 56.0 103	7 53.4 +135					
10	25 19.0	358 06.8 23.0	300 48.5 19.8	267 49.4 33.3	159 51.3 33.7	19 25.3 102	8 06.9 +135					
11	40 21.4	13 06.4 24.1	315 49.2 19.9	282 51.4 33.3	174 54.0 33.7	33 54.5 102	8 20.4 +135					
12	55 23.9	28 06.0 + 9 25.2	330 49.9 +24 20.0	297 53.4 +21 33.2	189 56.6 -14 33.6	48 23.7 100 +	8 33.9 +134					
13	70 26.4	43 05.6 26.3	345 50.5 20.1	312 55.5 33.1	204 59.3 33.6	62 52.7 100	8 47.3 +134					
14	85 28.8	58 05.2 27.4	0 51.2 20.1	327 57.5 33.0	220 01.9 33.5	77 21.7 99	9 00.7 +134					
15	100 31.3	73 04.8 .. 28.4	15 51.8 .. 20.2	342 59.6 .. 33.0	235 04.6 .. 33.5	91 50.6 98	9 14.1 +133					
16	115 33.7	88 04.4 29.5	30 52.5 20.3	358 01.6 32.9	250 07.2 33.4	106 19.4 97	9 27.4 +133					
17	130 36.2	103 04.1 30.6	45 53.2 20.4	13 03.6 32.8	265 09.9 33.4	120 48.1 96	9 40.7 +133					
18	145 38.7	118 03.7 + 9 31.7	60 53.8 +24 20.4	28 05.7 +21 32.8	280 12.5 -14 33.3	135 16.7 95 +	9 54.0 +132					
19	160 41.1	133 03.3 32.8	75 54.5 20.5	43 07.7 32.7	295 15.2 33.3	149 45.2 95	10 07.2 +132					
20	175 43.6	148 02.9 33.9	90 55.1 20.6	58 09.8 32.6	310 17.8 33.2	164 13.7 93	10 20.4 +131					
21	190 46.1	163 02.5 .. 34.9	105 55.8 .. 20.6	73 11.8 .. 32.5	325 20.5 .. 33.2	178 42.0 93	10 33.5 +131					
22	205 48.5	178 02.1 36.0	120 56.5 20.7	88 13.8 32.5	340 23.1 33.1	193 10.3 91	10 46.6 +130					
23	220 51.0	193 01.7 37.1	135 57.1 20.8	103 15.9 32.4	355 25.8 33.1	207 38.4 91	10 59.6 +130					
24	235 53.5	208 01.3 + 9 38.2	150 57.8 +24 20.8	118 17.9 +21 32.3	10 28.4 -14 33.0	222 06.5 90 +11	12.6 +130					
code	-	- 3 + 11	+ 7 + 1	+ 20 0	+ 26 + 1							

code

G M T	VENUS — 3.3		MARS 1.9		JUPITER — 1.5		SATURN 0.3		MOON				
	GHA	GHA Dec.	GHA Dec.	GHA Dec.	GHA Dec.	GHA Dec.	GHA Dec.	GHA code Dec. code					
19	h	o	o	o	o	o	o	o	o	o	o	o	
	0	235 53.5	208 01.3 + 9	38.2	150 57.8 +24	20.8	118 17.9 +21	32.3	10 28.4 -14	33.0	222 06.5	90 +11	12.6 +130
	1	250 55.9	223 00.9	39.3	165 58.4	20.9	133 20.0	32.2	25 31.0	33.0	236 34.5	89 11	25.6 +129
	2	265 58.4	238 00.5	40.3	180 59.1	21.0	148 22.0	32.2	40 33.7	32.9	251 02.4	87 11	38.5 +128
	3	281 00.9	253 00.1 ..	41.4	195 59.8 ..	21.1	163 24.0 ..	32.1	55 36.3 ..	32.9	265 30.1	87 ..11	51.3 +128
	4	296 03.3	267 59.7	42.5	211 00.4	21.1	178 26.1	32.0	70 39.0	32.8	279 57.8	86 12	04.1 +127
	5	311 05.8	282 59.3	43.6	226 01.1	21.2	193 28.1	32.0	85 41.6	32.8	294 25.4	85 12	16.8 +127
	6	326 08.2	297 59.0 + 9	44.7	241 01.7 +24	21.3	208 30.1 +21	31.9	100 44.3 -14	32.7	308 52.9	84 +12	29.5 +126
	7	341 10.7	312 58.6	45.7	256 02.4	21.3	223 32.2	31.8	115 46.9	32.7	323 20.3	83 12	42.1 +126
	8	356 13.2	327 58.2	46.8	271 03.1	21.4	238 34.2	31.7	130 49.6	32.7	337 47.6	82 12	54.7 +125
	9	11 15.6	342 57.8 ..	47.9	286 03.7 ..	21.5	253 36.3 ..	31.7	145 52.2 ..	32.6	352 14.8	81 ..13	07.2 +124
	10	26 18.1	357 57.4	49.0	301 04.4	21.5	268 38.3	31.6	160 54.9	32.6	6 41.9	80 13	19.6 +123
	11	41 20.6	12 57.0	50.1	316 05.0	21.6	283 40.3	31.5	175 57.5	32.5	21 08.9	79 13	31.9 +123
	12	56 23.0	27 56.6 + 9	51.1	331 05.7 +24	21.7	298 42.4 +21	31.4	191 00.2 -14	32.5	35 35.8	78 +13	44.2 +122
	13	71 25.5	42 56.2	52.2	346 06.3	21.7	313 44.4	31.4	206 02.8	32.4	50 02.6	77 13	56.4 +121
	14	86 28.0	57 55.8	53.3	1 07.0	21.8	328 46.4	31.3	221 05.5	32.4	64 29.3	76 14	08.5 +121
	15	101 30.4	72 55.4 ..	54.4	16 07.7 ..	21.8	343 48.5 ..	31.2	236 08.1 ..	32.3	78 55.9	74 ..14	20.6 +120
	16	116 32.9	87 55.0	55.4	31 08.3	21.9	358 50.5	31.1	251 10.7	32.3	93 22.3	74 14	32.6 +119
	17	131 35.3	102 54.6	56.5	46 09.0	22.0	13 52.5	31.1	266 13.4	32.2	107 48.7	73 14	44.5 +118
	18	146 37.8	117 54.2 + 9	57.6	61 09.6 +24	22.0	28 54.6 +21	31.0	281 16.0 -14	32.2	122 15.0	72 +14	56.3 +118
	19	161 40.3	132 53.8	58.7	76 10.3	22.1	43 56.6	30.9	296 18.7	32.1	136 41.2	70 15	08.1 +116
	20	176 42.7	147 53.4	9 59.7	91 11.0	22.2	58 58.6	30.8	311 21.3	32.1	151 07.2	70 15	19.7 +116
	21	191 45.2	162 53.0 ..10	00.8	106 11.6 ..	22.2	74 00.7 ..	30.8	326 24.0 ..	32.0	165 33.2	69 ..15	31.3 +115
	22	206 47.7	177 52.6	01.9	121 12.3	22.3	89 02.7	30.7	341 26.6	32.0	179 59.1	67 15	42.8 +113
23	221 50.1	192 52.2	03.0	136 12.9	22.3	104 04.8	30.6	356 29.3	31.9	194 24.8	67 15	54.1 +113	
20	0	236 52.6	207 51.8 +10	04.0	151 13.6 +24	22.4	119 06.8 +21	30.5	11 31.9 -14	31.9	208 50.5	65 +16	05.4 +112
	1	251 55.1	222 51.4	05.1	166 14.3	22.5	134 08.8	30.5	26 34.6	31.8	223 16.0	65 16	16.6 +111
	2	266 57.5	237 51.0	06.2	181 14.9	22.5	149 10.9	30.4	41 37.2	31.8	237 41.5	63 16	27.7 +110
	3	282 00.0	252 50.6 ..	07.2	196 15.6 ..	22.6	164 12.9 ..	30.3	56 39.9 ..	31.7	252 06.8	62 ..16	38.7 +109
	4	297 02.5	267 50.2	08.3	211 16.3	22.6	179 14.9	30.2	71 42.5	31.7	266 32.0	62 16	49.6 +108
	5	312 04.9	282 49.8	09.4	226 16.9	22.7	194 17.0	30.2	86 45.2	31.7	280 57.2	60 17	00.4 +107
	6	327 07.4	297 49.4 +10	10.5	241 17.6 +24	22.8	209 19.0 +21	30.1	101 47.8 -14	31.6	295 22.2	59 +17	11.1 +106
	7	342 09.8	312 49.0	11.5	256 18.2	22.8	224 21.0	30.0	116 50.4	31.6	309 47.1	58 17	21.7 +105
	8	357 12.3	327 48.6	12.6	271 18.9	22.9	239 23.1	29.9	131 53.1	31.5	324 11.9	57 17	32.2 +104
	9	12 14.8	342 48.2 ..	13.7	286 19.6 ..	22.9	254 25.1 ..	29.9	146 55.7 ..	31.5	338 36.6	56 ..17	42.6 +102
	10	27 17.2	357 47.8	14.7	301 20.2	23.0	269 27.1	29.8	161 58.4	31.4	353 01.2	55 17	52.8 +102
	11	42 19.7	12 47.4	15.8	316 20.9	23.1	284 29.2	29.7	177 01.0	31.4	7 25.7	55 18	03.0 +100
	12	57 22.2	27 47.0 +10	16.9	331 21.5 +24	23.1	299 31.2 +21	29.6	192 03.7 -14	31.3	21 50.2	53 +18	13.0 + 99
	13	72 24.6	42 46.6	17.9	346 22.2	23.2	314 33.2	29.6	207 06.3	31.3	36 14.5	52 18	22.9 + 98
	14	87 27.1	57 46.2	19.0	1 22.9	23.2	329 35.3	29.5	222 09.0	31.2	50 38.7	51 18	32.7 + 97
	15	102 29.6	72 45.8 ..	20.1	16 23.5 ..	23.3	344 37.3 ..	29.4	237 11.6 ..	31.2	65 02.8	50 ..18	42.4 + 95
	16	117 32.0	87 45.4	21.1	31 24.2	23.3	359 39.3	29.3	252 14.3	31.1	79 26.8	49 18	51.9 + 95
	17	132 34.5	102 45.0	22.2	46 24.8	23.4	14 41.4	29.3	267 16.9	31.1	93 50.7	48 19	01.4 + 92
	18	147 37.0	117 44.6 +10	23.3	61 25.5 +24	23.4	29 43.4 +21	29.2	282 19.5 -14	31.0	108 14.5	47 +19	10.6 + 92
	19	162 39.4	132 44.1	24.3	76 26.2	23.5	44 45.4	29.1	297 22.2	31.0	122 38.2	46 19	19.8 + 90
	20	177 41.9	147 43.7	25.4	91 26.8	23.5	59 47.4	29.0	312 24.8	30.9	137 01.8	45 19	28.8 + 89
	21	192 44.3	162 43.3 ..	26.5	106 27.5 ..	23.6	74 49.5 ..	29.0	327 27.5 ..	30.9	151 25.3	44 ..19	37.7 + 88
	22	207 46.8	177 42.9	27.5	121 28.1	23.7	89 51.5	28.9	342 30.1	30.8	165 48.7	43 19	46.5 + 86
	23	222 49.3	192 42.5	28.6	136 28.8	23.7	104 53.5	28.8	357 32.8	30.8	180 12.0	42 19	55.1 + 85
21	0	237 51.7	207 42.1 +10	29.7	151 29.5 +24	23.8	119 55.6 +21	28.7	12 35.4 -14	30.8	194 35.2	42 +20	03.6 + 84
	1	252 54.2	222 41.7	30.7	166 30.1	23.8	134 57.6	28.7	27 38.1	30.7	208 58.4	40 20	12.0 + 82
	2	267 56.7	237 41.3	31.8	181 30.8	23.9	149 59.6	28.6	42 40.7	30.7	223 21.4	40 20	20.2 + 80
	3	282 59.1	252 40.9 ..	32.8	196 31.4 ..	23.9	165 01.7 ..	28.5	57 43.4 ..	30.6	237 44.4	39 ..20	28.2 + 79
	4	298 01.6	267 40.5	33.9	211 32.1	24.0	180 03.7	28.4	72 46.0	30.6	252 07.3	37 20	36.1 + 78
	5	313 04.1	282 40.1	35.0	226 32.8	24.0	195 05.7	28.4	87 48.6	30.5	266 30.0	37 20	43.9 + 76
	6	328 06.5	297 39.7 +10	36.0	241 33.4 +24	24.1	210 07.7 +21	28.3	102 51.3 -14	30.5	280 52.7	37 +20	51.5 + 75
	7	343 09.0	312 39.3	37.1	256 34.1	24.1	225 09.8	28.2	117 53.9	30.4	295 15.4	35 20	59.0 + 73
	8	358 11.5	327 38.8	38.2	271 34.7	24.2	240 11.8	28.1	132 56.6	30.4	309 37.9	34 21	06.3 + 72
	9	13 13.9	342 38.4 ..	39.2	286 35.4 ..	24.2	255 13.8 ..	28.1	147 59.2 ..	30.3	324 00.3	34 ..21	13.5 + 70
	10	28 16.4	357 38.0	40.3	301 36.1	24.3	270 15.9	28.0	163 01.9	30.3	338 22.7	33 21	20.5 + 69
	11	43 18.8	12 37.6	41.3	316 36.7	24.3	285 17.9	27.9	178 04.5	30.2	352 45.0	32 21	27.4 + 67
	12	58 21.3	27 37.2 +10	42.4	331 37.4 +24	24.4	300 19.9 +21	27.8	193 07.2 -14	30.2	7 07.2	32 +21	34.1 + 65
	13	73 23.8	42 36.8	43.4	346 38.1	24.4	315 21.9	27.8	208 09.8	30.1	21 29.4	30 21	40.6 + 64
	14	88 26.2	57 36.4	44.5	1 38.7	24.5	330 24.0	27.7	223 12.5	30.1	35 51.4	30 21	47.0 + 62
	15	103 28.7	72 36.0 ..	45.6	16 39.4 ..	24.5	345 26.0 ..	27.6	238 15.1 ..	30.0	50 13.4	30 ..21	53.2 + 60
	16	118 31.2	87 35.5	46.6	31 40.0	24.5	0 28.0	27.5	253 17.7	30.0	64 35.4	28 21	59.2 + 59
	17	133 33.6	102 35.1	47.7	46 40.7	24.6	15 30.1	27.4	268 20.4	30.0	78 57.2	28 22	05.1 + 57
	18	148 36.1	117 34.7 +10	48.7	61 41.4 +24	24.6	30 32.1 +21	27.4	283 23.0 -14	29.9	93 19.0	28 +22	10.8 + 56
	19	163 38.6	132 34.3	49.8	76 42.0	24.7	45 34.1	27.3	298 25.7	29.9	107 40.8	27 22	16.4 + 54
	20	178 41.0	147 33.9	50.9	91 42.7	24.7	60 36.1	27.2	313 28.3	29.8	122 02.5	26 22	21.8 + 52
	21	193 43.5	162 33.5 ..	51.9	106 43.3 ..	24.8	75 38.2 ..	27.1	328 31.0 ..	29.8	136 24.1	26 ..22	27.0 + 50
	22	208 45.9	177 33.1	53.0	121 44.0	24.8	90 40.2	27.1	343 33.6	29.7	150 45.7	25 22	32.0 + 49
	23	223 48.4	192 32.6	54.0	136 44.7	24.9	105 42.2	27.0	358 36.3	29.7	165 07.2	24 22	36.9 + 47
24	238 50.9	207 32.2 +10	55.1	151 45.3 +24	24.9	120 44.2 +21							

G M T	SUN		STARS		Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS						
	GHA	Dec.	No.	Name SHA Dec.				19	20	21	22	Alt.	Sun's Low r Limb	Venus	Mars			
h	°	'	°	'	N	h	m	h	m	h	m	h	m	°	'	'	'	
19	0	180 55.1	+19 33.1	7 Acamar	315 51.7	-40 28.9	72	0	0	0 43 123 59	0	0	0	0	0	0	0	
	1	195 55.1	33.6	5 Achernar	335 59.5	-57 27.5	70	0	0	0 37 123 32	0	0	0	0	0	0	0	
	2	210 55.1	34.2	30 Acrux	173 57.7	-62 51.5	68	1	21	1 05	1 05	0 47	0	0	0	0	0	
	3	225 55.1	34.7	19 Adhara	255 47.0	-28 54.8	66	2	05	1 27	1 25	1 25	1 28	0	0	0	0	
	4	240 55.1	35.3	10 Aldebaran	291 39.7	+16 25.3	64	2	34	1 37	1 42	1 51	2 12	0	0	0	0	
	5	255 55.0	35.8				62	2	55	1 46	1 56	2 12	2 42	30	0.1	0.1	0.1	
	6	270 55.0	+19 36.4	32 Alioth	166 58.3	+56 12.2	60	3	13	1 54	2 08	2 29	3 04	45	0.1	0.1	0.0	
	7	285 55.0	36.9	34 Alkaid	153 32.6	+49 32.1	58	3	27	2 00	2 18	2 44	3 22	60	0.1	0.1	0.0	
	8	300 55.0	37.4	55 Al Na'ir	28 38.3	-47 10.4	56	3	40	2 06	2 27	2 56	3 38	75	0.1	0.0	0.0	
	9	315 54.9	38.0	15 Alnilam	276 30.9	-1 13.8	54	3	50	2 11	2 35	3 07	3 51	90	0.1	0.0	0.0	
	10	330 54.9	38.5	25 Alphard	218 38.9	-8 28.1	52	4	00	2 22	2 43	3 17	4 03					
	11	345 54.9	39.1				50	4	08	2 20	2 49	3 25	4 13					
	12	0 54.8	+19 39.6	41 Alphecca	126 47.5	+26 51.7	45	4	26	2 30	3 03	3 44	4 35					
	13	15 54.8	40.2	1 Alpheratz	358 28.8	+28 50.6	40	4	41	2 49	3 38	3 15	3 59					
	14	30 54.8	40.7	51 Altair	62 50.5	+8 44.9	35	4	53	3 14	2 45	3 25	4 12					
	15	45 54.8	41.3	2 Ankaa	353 58.8	-42 32.6	30	5	04	3 33	2 51	3 34	4 23					
	16	60 54.7	41.8	42 Antares	113 19.3	-26 20.2	20	5	22	4 02	3 01	3 49	4 43					
	17	75 54.7	42.3				10	5	38	4 23	3 11	4 02	4 59					
	18	90 54.7	+19 42.9	37 Arcturus	146 35.1	+19 24.7	0	5	53	4 40	3 19	4 15	5 15					
	19	105 54.7	43.4	43 Atria	108 59.7	-68 56.9	10	6	07	4 53	3 28	4 28	5 31					
	20	120 54.6	43.9	22 Avior	234 36.2	-59 22.3	20	6	23	5 05	3 38	4 42	5 49					
	21	135 54.6	44.5	13 Bellatrix	279 19.0	+6 18.6	30	6	40	5 17	3 49	4 58	6 09					
	22	150 54.6	45.0	16 Betelge'se	271 48.7	+7 24.0	35	6	50	5 22	3 55	5 07	6 20					
	23	165 54.5	45.6				40	7	02	5 27	4 03	5 18	6 34					
				17 Canopus	264 15.9	-52 40.4	45	7	16	5 31	4 11	5 30	6 50					
				12 Capella	281 39.3	+45 57.3	50	7	32	5 37	4 22	5 45	7 10					
				53 Deneb	50 01.0	+45 07.0	52	7	40	5 38	4 26	5 53	7 19					
				28 Denebola	183 17.8	+14 49.2	54	7	49	5 41	4 32	6 01	7 30					
				4 Diphda	349 39.7	-18 13.8	56	7	58	5 43	4 38	6 10	7 42					
							58	8	09	5 45	4 44	6 20	7 56					
				27 Dubhe	194 44.7	+61 59.7	60	8	22	5 48	4 52	6 32	8 12					
				14 Elnath	279 08.0	+28 34.3	S											
				47 Eltanin	91 05.9	+51 29.5		Lat.	Sunset	Twlt. ends	Moonset							
				54 Enif	34 29.8	+9 40.1		N	h	m	h	m	h	m	h	m		
				56 Fomalhaut	16 12.0	-29 51.3			h	m	h	m	h	m	h	m		
				31 Gacrux	172 49.2	-56 52.2	72		0	0	19 39	0	0	0	0	0		
				29 Gienah	176 37.0	-17 17.9	70		0	0	19 03	22 12	0	0	0	0		
				35 Hadar	149 49.2	-60 09.8	68	22	38	111	18 37	20 58	0	0	0	0		
				6 Hamal	328 50.3	+23 15.1	66	21	51	111	18 18	20 21	22 29	24 16				
				48 Kaus Aust.	84 41.2	-34 24.4	64	21	22	111	18 02	19 55	21 46	23 14				
							62	21	00	111	17 49	19 35	21 17	22 40				
				40 Kochab	137 16.7	+74 20.3	60	20	42	111	17 38	19 18	20 55	22 15				
				57 Markab	14 21.8	+14 57.9	58	20	27	111	17 29	19 05	20 36	21 55				
				8 Menkar	315 00.9	+3 54.9	56	20	14	111	17 21	18 53	20 22	21 38				
				36 Menkent	148 58.6	-36 09.3	54	20	03	111	17 13	18 42	20 09	21 24				
				24 Miapl'dus	221 49.3	-69 32.4	52	19	54	23 53	17 07	18 33	19 57	21 12				
							50	19	45	22 40	17 01	18-25	19 47	21 01				
				9 Mirfak	309 43.3	+49 42.2	45	19	27	21 40	16 48	18 08	19 26	20 38				
				50 Nunki	76 51.9	-26 21.2	40	19	12	21 05	16 38	17 54	19 09	20 20				
				52 Peacock	54 27.4	-56 52.5	35	19	00	20 40	16 29	17 42	18 55	20 04				
				21 Pollux	244 21.1	+28 08.2	30	18	49	20 21	16 21	17 31	18 42	19 51				
				20 Procyon	245 45.5	+5 20.3	20	18	31	19 52	16 08	17 13	18 21	19 28				
							10	18	15	19 30	15 56	16 58	18 03	19 09				
				46 R'alhague	96 46.5	+12 35.4	0	18	00	19 13	15 45	16 43	17 45	18 50				
				26 Regulus	208 29.8	+12 11.1	10	17	46	19 00	15 35	16 29	17 28	18 32				
				11 Rigel	281 54.2	-8 15.2	20	17	30	18 47	15 23	16 13	17 10	18 12				
				38 Rigil Kent.	140 50.7	-60 39.4	30	17	12	18 35	15 10	15 56	16 49	17 49				
				44 Sabik	103 02.1	-15 40.3	35	17	02	18 30	15 02	15 46	16 36	17 36				
							40	16	51	18 26	14 54	15 34	16 22	17 20				
				3 Schedar	350 30.7	+56 17.4	45	16	37	18 20	14 44	15 20	16 05	17 01				
				45 Shaula	97 20.6	-37 04.4	50	16	20	18 14	14 32	15 04	15 45	16 38				
				18 Sirius	259 12.4	-16 39.4	52	16	13	18 13	14 26	14 56	15 35	16 27				
				33 Spica	159 16.9	-10 55.9	54	16	04	18 11	14 20	14 47	15 24	16 15				
				23 Suhail	223 24.6	-43 15.4	56	15	54	18 08	14 13	14 37	15 11	16 01				
							58	15	43	18 06	14 06	14 26	14 57	15 44				
				49 Vega	81 08.1	+38 44.3	60	15	30	18 03	13 57	14 14	14 40	15 24				
				39 Zub'g'bi	137 53.3	-15 51.6	S											
	G M T	Equation of Time (App.—Mean)				GMT of Transit Meridian of Greenwich												
		19	20	21		DAY	Moon	Venus	Mars	Jupiter	Saturn							
	h	m	s	m	s		h	m	h	m	h	m	h	m				
	0	+ 3 40.7	+ 3 38.1	+ 3 35.0														
	6	+ 3 40.1	+ 3 37.4	+ 3 34.1		19	9 32	10 08	13 56	16 05	23 14							
	12	+ 3 39.4	+ 3 36.6	+ 3 33.2		20	10 29	10 09	13 55	16 01	23 10							
	18	+ 3 38.8	+ 3 35.8	+ 3 32.3		21	11 30	10 10	13 53	15 58	23 06							
	24	+ 3 38.1	+ 3 35.0	+ 3 31.3		22	12 35	10 10	13 52	15 55	23 01							
	24	180 52.8	+20 11.1															
code	-	+ 5																

G M T	VENUS — 3.3		MARS 1.9		JUPITER — 1.5		SATURN 0.3		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
h	°	'	°	'	°	'	°	'	°	'	°	'
22 0	238 50.9	207 32.2 +10 55.1	151 45.3 +24 24.9	120 44.2 +21 26.9	13 38.9 -14 29.6	179 28.6 25 +22 41.6 + 45						
1	253 53.3	222 31.8 56.1	166 46.0 25.0	135 46.3 26.8	28 41.5 29.6	193 50.1 23 22 46.1 + 43						
2	268 55.8	237 31.4 57.2	181 46.6 25.0	150 48.3 26.8	43 44.2 29.5	208 11.4 23 22 50.4 + 42						
3	283 58.3	252 31.0 .. 58.2	196 47.3 .. 25.0	165 50.3 .. 26.7	58 46.8 .. 29.5	222 32.7 23 22 54.6 + 40						
4	299 00.7	267 30.6 10 59.3	211 48.0 25.1	180 52.4 26.6	73 49.5 29.4	236 54.0 23 22 58.6 + 38						
5	314 03.2	282 30.1 11 00.3	226 48.6 25.1	195 54.4 26.5	88 52.1 29.4	251 15.3 22 23 02.4 + 37						
6	329 05.7	297 29.7 +11 01.4	241 49.3 +24 25.2	210 56.4 +21 26.4	103 54.8 -14 29.3	265 36.5 21 +23 06.1 + 34						
7	344 08.1	312 29.3 02.4	256 50.0 25.2	225 58.4 26.4	118 57.4 29.3	279 57.6 22 23 09.5 + 33						
8	359 10.6	327 28.9 03.5	271 50.6 25.3	241 00.5 26.3	134 00.0 29.3	294 18.8 21 23 12.8 + 31						
9	14 13.1	342 28.5 .. 04.5	286 51.3 .. 25.3	256 02.5 .. 26.2	149 02.7 .. 29.2	308 39.9 21 23 15.9 + 29						
10	29 15.5	357 28.0 05.6	301 51.9 25.3	271 04.5 26.1	164 05.3 29.2	323 01.0 20 23 18.8 + 28						
11	44 18.0	12 27.6 06.6	316 52.6 25.4	286 06.5 26.1	179 08.0 29.1	337 22.0 21 23 21.6 + 25						
12	59 20.4	27 27.2 +11 07.7	331 53.3 +24 25.4	301 08.6 +21 26.0	194 10.6 -14 29.1	351 43.1 20 +23 24.1 + 24						
13	74 22.9	42 26.8 08.7	346 53.9 25.5	316 10.6 25.9	209 13.3 29.0	6 04.1 20 23 26.5 + 22						
14	89 25.4	57 26.4 09.8	1 54.6 25.5	331 12.6 25.8	224 15.9 29.0	20 25.1 20 23 28.7 + 20						
15	104 27.8	72 25.9 .. 10.8	16 55.2 .. 25.5	346 14.6 .. 25.8	239 18.6 .. 28.9	34 46.1 20 23 30.7 + 18						
16	119 30.3	87 25.5 11.9	31 55.9 25.6	1 16.6 25.7	254 21.2 28.9	49 07.1 20 23 32.5 + 16						
17	134 32.8	102 25.1 12.9	46 56.6 25.6	16 18.7 25.6	269 23.8 28.8	63 28.1 19 23 34.1 + 15						
18	149 35.2	117 24.7 +11 14.0	61 57.2 +24 25.6	31 20.7 +21 25.5	284 26.5 -14 28.8	77 49.0 20 +23 35.6 + 12						
19	164 37.7	132 24.3 15.0	76 57.9 25.7	46 22.7 25.4	299 29.1 28.7	92 10.0 20 23 36.8 + 11						
20	179 40.2	147 23.8 16.1	91 58.6 25.7	61 24.7 25.4	314 31.8 28.7	106 31.0 19 23 37.9 + 9						
21	194 42.6	162 23.4 .. 17.1	106 59.2 .. 25.8	76 26.8 .. 25.3	329 34.4 .. 28.6	120 51.9 20 23 38.8 + 7						
22	209 45.1	177 23.0 18.2	121 59.9 25.8	91 28.8 25.2	344 37.1 28.6	135 12.9 20 23 39.5 + 6						
23	224 47.6	192 22.6 19.2	137 00.5 25.8	106 30.8 25.1	359 39.7 28.6	149 33.9 20 23 40.1 + 3						
23 0	239 50.0	207 22.1 +11 20.3	152 01.2 +24 25.9	121 32.8 +21 25.1	14 42.3 -14 28.5	163 54.9 20 +23 40.4 + 2						
1	254 52.5	222 21.7 21.3	167 01.9 25.9	136 34.9 25.0	29 45.0 28.5	178 15.9 20 23 40.6 - 1						
2	269 54.9	237 21.3 22.3	182 02.5 25.9	151 36.9 24.9	44 47.6 28.4	192 36.9 21 23 40.5 - 2						
3	284 57.4	252 20.9 .. 23.4	197 03.2 .. 26.0	166 38.9 .. 24.8	59 50.3 .. 28.4	206 58.0 20 23 40.3 - 3						
4	299 59.9	267 20.4 24.4	212 03.8 26.0	181 40.9 24.7	74 52.9 28.3	221 19.0 21 23 40.0 - 6						
5	315 02.3	282 20.0 25.5	227 04.5 26.0	196 42.9 24.7	89 55.6 28.3	235 40.1 22 23 39.4 - 8						
6	330 04.8	297 19.6 +11 26.5	242 05.2 +24 26.1	211 45.0 +21 24.6	104 58.2 -14 28.2	250 01.3 21 +23 38.6 - 9						
7	345 07.3	312 19.2 27.6	257 05.8 26.1	226 47.0 24.5	120 00.8 28.2	264 22.4 22 23 37.7 - 11						
8	0 09.7	327 18.7 28.6	272 06.5 26.1	241 49.0 24.4	135 03.5 28.1	278 43.6 22 23 36.6 - 13						
9	15 12.2	342 18.3 .. 29.6	287 07.2 .. 26.2	256 51.0 .. 24.3	150 06.1 .. 28.1	293 04.8 23 23 35.3 - 15						
10	30 14.7	357 17.9 30.7	302 07.8 26.2	271 53.0 24.3	165 08.8 28.1	307 26.1 23 23 33.8 - 17						
11	45 17.1	12 17.4 31.7	317 08.5 26.2	286 55.1 24.2	180 11.4 28.0	321 47.4 23 23 32.1 - 18						
12	60 19.6	27 17.0 +11 32.8	332 09.1 +24 26.3	301 57.1 +21 24.1	195 14.1 -14 28.0	336 08.7 24 +23 30.3 - 20						
13	75 22.1	42 16.6 33.8	347 09.8 26.3	316 59.1 24.0	210 16.7 27.9	350 30.1 25 23 28.3 - 22						
14	90 24.5	57 16.2 34.8	2 10.5 26.3	332 01.1 24.0	225 19.3 27.9	4 51.6 25 23 26.1 - 24						
15	105 27.0	72 15.7 .. 35.9	17 11.1 .. 26.4	347 03.1 .. 23.9	240 22.0 .. 27.8	19 13.1 25 23 23.7 - 26						
16	120 29.4	87 15.3 36.9	32 11.8 26.4	2 05.2 23.8	255 24.6 27.8	33 34.6 26 23 21.1 - 27						
17	135 31.9	102 14.9 37.9	47 12.5 26.4	17 07.2 23.7	270 27.3 27.7	47 56.2 27 23 18.4 - 29						
18	150 34.4	117 14.4 +11 39.0	62 13.1 +24 26.4	32 09.2 +21 23.6	285 29.9 -14 27.7	62 17.9 27 +23 15.5 - 31						
19	165 36.8	132 14.0 40.0	77 13.8 26.5	47 11.2 23.6	300 32.5 27.6	76 39.6 28 23 12.4 - 32						
20	180 39.3	147 13.6 41.1	92 14.4 26.5	62 13.2 23.5	315 35.2 27.6	91 01.4 28 23 09.2 - 34						
21	195 41.8	162 13.1 .. 42.1	107 15.1 .. 26.5	77 15.3 .. 23.4	330 37.8 .. 27.5	105 23.2 29 23 05.8 - 36						
22	210 44.2	177 12.7 43.1	122 15.8 26.6	92 17.3 23.3	345 40.5 27.5	119 45.1 30 23 02.2 - 38						
23	225 46.7	192 12.3 44.2	137 16.4 26.6	107 19.3 23.2	0 43.1 27.5	134 07.1 30 22 58.4 - 39						
24 0	240 49.2	207 11.8 +11 45.2	152 17.1 +24 26.6	122 21.3 +21 23.2	15 45.8 -14 27.4	148 29.1 32 +22 54.5 - 41						
1	255 51.6	222 11.4 46.2	167 17.8 26.6	137 23.3 23.1	30 48.4 27.4	162 51.3 32 22 50.4 - 43						
2	270 54.1	237 11.0 47.3	182 18.4 26.7	152 25.4 23.0	45 51.0 27.3	177 13.5 32 22 46.1 - 44						
3	285 56.5	252 10.5 .. 48.3	197 19.1 .. 26.7	167 27.4 .. 22.9	60 53.7 .. 27.3	191 35.7 34 22 41.7 - 46						
4	300 59.0	267 10.1 49.3	212 19.7 26.7	182 29.4 22.8	75 56.3 27.2	205 58.1 34 22 37.1 - 47						
5	316 01.5	282 09.7 50.4	227 20.4 26.7	197 31.4 22.8	90 59.0 27.2	220 20.5 36 22 32.4 - 49						
6	331 03.9	297 09.2 +11 51.4	242 21.1 +24 26.8	212 33.4 +21 22.7	106 01.6 -14 27.1	234 43.1 36 +22 27.5 - 51						
7	346 06.4	312 08.8 52.4	257 21.7 26.8	227 35.4 22.6	121 04.2 27.1	249 05.7 37 22 22.4 - 52						
8	1 08.9	327 08.4 53.5	272 22.4 26.8	242 37.5 22.5	136 06.9 27.0	263 28.4 37 22 17.2 - 54						
9	16 11.3	342 07.9 .. 54.5	287 23.1 .. 26.8	257 39.5 .. 22.5	151 09.5 .. 27.0	277 51.1 39 22 11.8 - 55						
10	31 13.8	357 07.5 55.5	302 23.7 26.9	272 41.5 22.4	166 12.2 27.0	292 14.0 40 22 06.3 - 57						
11	46 16.3	12 07.0 56.5	317 24.4 26.9	287 43.5 22.3	181 14.8 26.9	306 37.0 40 22 00.6 - 59						
12	61 18.7	27 06.6 +11 57.6	332 25.1 +24 26.9	302 45.5 +21 22.2	196 17.5 -14 26.9	321 00.0 42 +21 54.7 - 59						
13	76 21.2	42 06.2 58.6	347 25.7 26.9	317 47.5 22.1	211 20.1 26.8	335 23.2 42 21 48.8 - 62						
14	91 23.7	57 05.7 11 59.6	2 26.4 27.0	332 49.6 22.1	226 22.7 26.8	349 46.4 43 21 42.6 - 63						
15	106 26.1	72 05.3 12 00.7	17 27.0 .. 27.0	347 51.6 .. 22.0	241 25.4 .. 26.7	4 09.7 45 21 36.3 - 64						
16	121 28.6	87 04.9 01.7	32 27.7 27.0	2 53.6 21.9	256 28.0 26.7	18 33.2 45 21 29.9 - 66						
17	136 31.0	102 04.4 02.7	47 28.4 27.0	17 55.6 21.8	271 30.7 26.6	32 56.7 46 21 23.3 - 67						
18	151 33.5	117 04.0 +12 03.7	62 29.0 +24 27.0	32 57.6 +21 21.7	286 33.3 -14 26.6	47 20.3 48 +21 16.6 - 69						
19	166 36.0	132 03.5 04.8	77 29.7 27.1	47 59.6 21.7	301 35.9 26.5	61 44.1 48 21 09.7 - 70						
20	181 38.4	147 03.1 05.8	92 30.4 27.1	63 01.7 21.6	316 38.6 26.5	76 07.9 49 21 02.7 - 71						
21	196 40.9	162 02.7 .. 06.8	107 31.0 .. 27.1	78 03.7 .. 21.5	331 41.2 .. 26.5	90 31.8 51 20 55.6 - 73						
22	211 43.4	177 02.2 07.8	122 31.7 27.1	93 05.7 21.4	346 43.9 26.4	104 55.9 51 20 48.3 - 74						
23	226 45.8	192 01.8 08.9	137 32.3 27.1	108 07.7 21.3	1 46.5 26.4	119 20.0 53 20 40.9 - 75						
24	241 48.3	207 01.3 +12 09.9	152 33.0 +24 27.2	123 09.7 +21 21.3	16 49.1 -14 26.3	133 44.3 54 +20 33.4 - 77						
code	-	- 4 + 10	+ 7 0	+ 20 - 1	+ 26 + 1							

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS						
	GHA	Dec.	No.	Name	SHA	Dec.				22	23	24	25							
														Alt.	Sun's Low'r Limb	Venus	Mars			
h	°	'	°	'	°	'	N	h	m	h	m	h	m	h	m	°	'	'	'	
22	0	180 52.8 +20 11.1	7	Acamar	315 51.7	-40 28.9	72	0	0	0	0	0	0	0	0	0	0	0	0	
	1	195 52.8 11.6	5	Achernar	335 59.5	-57 27.5	70	0	0	0	0	0	0	0	0	0	0	0	0	
	2	210 52.7 12.2	30	Acrux	173 57.7	-62 51.5	68	1 00	///	0	0	0	0	0	0	0	0	0	0	
	3	225 52.7 .. 12.7	19	Adhara	255 47.0	-28 54.8	66	1 53	///	1 28	1 59	3 42	5 46	0	0	0	0	0	0	
	4	240 52.6 13.2	10	Aldebaran	291 39.7	+16 25.3	64	2 24	///	2 12	3 00	4 26	6 13	0	0	0.1	0.1	0.1	0.1	
	5	255 52.6 13.7					62	2 48	///	2 42	3 35	4 56	6 33	30	0.1	0.1	0.1	0.0	0.0	
	6	270 52.6 +20 14.2	32	Alioth	166 58.3	+56 12.2	60	3 06	///	3 04	4 00	5 18	6 50	45	0.1	0.1	0.1	0.0	0.0	
	7	285 52.5 14.7	34	Alkaid	153 32.7	+49 32.1	58	3 22	///	3 22	4 20	5 36	7 04	60	0.1	0.0	0.0	0.0	0.0	
	8	300 52.5 15.2	55	Al Na'ir	28 38.2	-47 10.4	56	3 35	///	3 38	4 36	5 51	7 16	75	0.1	0.0	0.0	0.0	0.0	
	9	315 52.4 .. 15.7	15	Anilam	276 30.8	-1 13.8	54	3 46	///	3 51	4 50	6 04	7 27	90	0.1	0.0	0.0	0.0	0.0	
	10	330 52.4 16.2	25	Alphard	218 38.9	-8 28.1	52	3 56	///	4 03	5 03	6 16	7 36							
	11	345 52.3 16.7					50	4 05	1 05	4 13	5 14	6 26	7 44	Moon's Lower Limb						
	12	0 52.3 +20 17.2	41	Alphecca	126 47.5	+26 51.7	45	4 24	2 10	4 35	5 36	6 47	8 02	Add						
	13	15 52.3 17.7	1	Alpheratz	358 28.8	+28 50.6	40	4 39	2 46	4 52	5 55	7 04	8 17	Alt.	22	23	24			
	14	30 52.2 18.2	51	Altair	62 50.5	+8 44.9	35	4 52	3 11	5 07	6 10	7 18	8 29	°	'	'	'			
	15	45 52.2 .. 18.7	2	Ankaa	353 58.8	-42 32.6	30	5 03	3 31	5 20	6 23	7 31	8 39	0	21.0	20.8	20.0			
	16	60 52.1 19.2	42	Antares	113 19.3	-26 20.2	20	5 22	4 01	5 42	6 46	7 52	8 57	4	21.0	20.7	20.0			
	17	75 52.1 19.7					10	5 38	4 22	6 01	7 06	8 11	9 13	8	21.0	20.7	20.0			
	18	90 52.0 +20 20.2	37	Arcturus	146 35.1	+19 24.7	0	5 53	4 40	6 19	7 24	8 28	9 28	12	20.9	20.6	19.9			
	19	105 52.0 20.7	43	Atria	108 59.7	-68 56.9	10	6 08	4 54	6 37	7 43	8 45	9 43	16	20.8	20.6	19.8			
	20	120 52.0 21.2	22	Avior	234 36.2	-59 22.3	20	6 24	5 07	6 57	8 03	9 04	9 58	20	20.7	20.5	19.8			
	21	135 51.9 .. 21.7	13	Bellatrix	279 19.0	+6 18.6	30	6 42	5 18	7 19	8 26	9 25	10 16	24	20.6	20.4	19.6			
	22	150 51.9 22.2	16	Betelge'se	271 48.7	+7 24.0	35	6 53	5 24	7 32	8 39	9 37	10 27	28	20.4	20.2	19.5			
	23	165 51.8 22.7					40	7 05	5 29	7 48	8 55	9 51	10 38	32	20.3	20.1	19.4			
			17	Canopus	264 15.9	-52 40.4	45	7 19	5 35	8 06	9 13	10 08	10 52	36	20.1	19.9	19.3			
			12	Capella	281 39.3	+45 57.3	50	7 36	5 40	8 29	9 36	10 29	11 09	40	19.9	19.7	19.1			
			53	Deneb	50 01.0	+45 07.0	52	7 44	5 42	8 40	9 47	10 39	11 17	44	19.7	19.5	18.9			
			28	Denebola	183 17.8	+14 49.2	54	7 53	5 45	8 52	9 59	10 50	11 26	48	19.5	19.3	18.8			
			4	Diphda	349 39.7	-18 13.7	56	8 04	5 47	9 06	10 14	11 03	11 36	52	19.2	19.1	18.6			
							58	8 15	5 49	9 23	10 31	11 17	11 47	56	19.0	18.8	18.4			
			27	Dubhe	194 44.7	+61 59.7	60	8 29	5 53	9 42	10 51	11 34	12 00	60	18.7	18.6	18.1			
			14	Elnath	279 08.0	+28 34.3	S							64	18.5	18.3	17.9			
			47	Eltanin	91 05.9	+51 29.5	Lat.	Sunset	Twlt. ends	Moonset				68	18.2	18.1	17.7			
			54	Enif	34 29.8	+9 40.2	N	h m	h m	h m	h m	h m	h m	72	17.9	17.8	17.5			
			56	Fomalhaut	16 11.9	-29 51.3	°	h m	h m	h m	h m	h m	h m	76	17.6	17.5	17.2			
			31	Gacrux	172 49.2	-56 52.2	72	0	0	0	0	0	0	80	17.3	17.2	17.0			
			29	Genah	176 37.0	-17 17.9	70	0	0	0	0	0	0	84	17.0	17.0	16.7			
			35	Hadar	149 49.2	-60 09.8	68	23 02	///	0	0	0	0	88	16.8	16.7	16.6			
			6	Hamal	328 50.2	+23 15.1	66	22 04	///	24 16	0 16	0 48	0 51	90	Add to table, back cover					
			48	Kaus Aust.	84 41.2	-34 24.4	64	21 31	///	23 14	24 03	0 03	0 24		Moon's Upper Limb					
							62	21 07	///	22 40	23 33	24 02	0 02		Subtract					
			40	Kochab	137 16.7	+74 20.3	60	20 48	///	22 15	23 11	23 45	24 06	Alt.	22	23	24			
			57	Markab	14 21.8	+14 57.9	58	20 33	///	21 55	22 52	23 30	23 55	°	'	'	'			
			8	Menkar	315 00.9	+3 55.0	56	20 20	///	21 38	22 37	23 18	23 46	0	12.4	12.6	13.0			
			36	Menkent	148 58.6	-36 09.3	54	20 08	///	21 24	22 24	23 07	23 38	4	12.5	12.6	13.1			
			24	Miapl'dus	221 49.4	-69 32.4	52	19 58	///	21 12	22 12	22 57	23 30	8	12.5	12.7	13.1			
							50	19 49	22 53	21 01	22 02	22 48	23 23	12	12.6	12.8	13.2			
			9	Mirfak	309 43.3	+49 42.2	45	19 30	21 46	20 38	21 40	22 29	23 09	16	12.7	12.9	13.3			
			50	Nunki	76 51.9	-26 21.2	40	19 15	21 10	20 20	21 22	22 14	22 57	20	12.9	13.0	13.4			
			52	Peacock	54 27.4	-56 52.5	35	19 02	20 44	20 04	21 07	22 01	22 47	24	13.0	13.1	13.5			
			21	Pollux	244 21.1	+28 08.1	30	18 51	20 24	19 51	20 54	21 50	22 37	28	13.2	13.3	13.6			
			20	Procyon	245 45.5	+5 20.3	20	18 32	19 54	19 28	20 32	21 30	22 22	32	13.3	13.4	13.7			
							10	18 15	19 31	19 09	20 13	21 13	22 08	36	13.5	13.6	13.9			
			46	R'alhague	96 46.5	+12 35.4	0	18 00	19 13	18 50	19 55	20 57	21 55	40	13.7	13.8	14.1			
			26	Regulus	208 29.8	+12 11.1	10	17 45	18 59	18 32	19 37	20 41	21 42	44	14.0	14.0	14.3			
			11	Rigel	281 54.2	-8 15.2	20	17 29	18 46	18 12	19 17	20 24	21 28	48	14.2	14.3	14.4			
			38	Rigil Kent.	140 50.7	-60 39.4	30	17 11	18 35	17 49	18 55	20 03	21 11	52	14.4	14.5	14.6			
			44	Sabik	103 02.1	-15 40.3	35	17 00	18 29	17 36	18 42	19 52	21 02	56	14.7	14.7	14.9			
							40	16 48	18 23	17 20	18 27	19 38	20 51	60	15.0	15.0	15.1			
			3	Schedar	350 30.6	+56 17.4	45	16 34	18 18	17 01	18 08	19 22	20 38	64	15.2	15.3	15.3			
			45	Shaula	97 20.6	-37 04.4	50	16 17	18 12	16 38	17 46	19 02	20 22	68	15.5	15.5	15.5			
			18	Sirius	259 12.4	-16 39.3	52	16 09	18 10	16 27	17 35	18 53	20 15	72	15.8	15.8	15.8			
			33	Spica	159 16.9	-10 55.9	54	16 00	18 08	16 15	17 22	18 42	20 07	76	16.1	16.1	16.0			
			23	Suhail	223 24.7	-43 15.4	56	15 49	18 04	16 01	17 08	18 30	19 57	80	16.4	16.4	16.3			
							58	15 38	18 02	15 44	16 52	18 16	19 47	84	16.6	16.6	16.4			
			49	Vega	81 08.1	+38 44.3	60	15 24	17 59	15 24	16 32	17 59	19 34	88	Subtract from table, back cover					
			39	Zub'g'bi	137 53.3	-15 51.6	S							92						
			Equation of																	

G M T	VENUS — 3.3		MARS 1.9		JUPITER — 1.5		SATURN 0.4		MOON				
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code	
h	'	'	'	'	'	'	'	'	'	'	'	'	
25	0	241 48.3	207 01.3	+12 09.9	152 33.0	+24 27.2	123 09.7	+21 21.3	16 49.1	-14 26.3	133 44.3	54	+20 33.4 - 77
	1	256 50.8	222 00.9	10.9	167 33.7	27.2	138 11.7	21.2	31 51.8	26.3	148 08.7	54	20 25.7 - 78
	2	271 53.2	237 00.4	11.9	182 34.3	27.2	153 13.7	21.1	46 54.4	26.2	162 33.1	56	20 17.9 - 79
	3	286 55.7	252 00.0	12.9	197 35.0	27.2	168 15.8	21.0	61 57.1	26.2	176 57.7	57	20 10.0 - 81
	4	301 58.2	266 59.6	14.0	212 35.7	27.2	183 17.8	20.9	76 59.7	26.1	191 22.4	58	20 01.9 - 81
	5	317 00.6	281 59.1	15.0	227 36.3	27.2	198 19.8	20.9	92 02.3	26.1	205 47.2	59	19 53.8 - 83
	6	332 03.1	296 58.7	+12 16.0	242 37.0	+24 27.3	213 21.8	+21 20.8	107 05.0	-14 26.0	220 12.1	60	+19 45.5 - 85
	7	347 05.5	311 58.2	17.0	257 37.7	27.3	228 23.8	20.7	122 07.6	26.0	234 37.1	61	19 37.0 - 85
	8	2 08.0	326 57.8	18.1	272 38.3	27.3	243 25.8	20.6	137 10.3	26.0	249 02.2	63	19 28.5 - 87
	9	17 10.5	341 57.3	19.1	287 39.0	27.3	258 27.8	20.5	152 12.9	25.9	263 27.5	63	19 19.8 - 87
	10	32 12.9	356 56.9	20.1	302 39.6	27.3	273 29.8	20.4	167 15.5	25.9	277 52.8	65	19 11.1 - 89
	11	47 15.4	11 56.4	21.1	317 40.3	27.3	288 31.9	20.4	182 18.2	25.8	292 18.3	65	19 02.2 - 90
	12	62 17.9	26 56.0	+12 22.1	332 41.0	+24 27.4	303 33.9	+21 20.3	197 20.8	-14 25.8	306 43.8	67	+18 53.2 - 91
	13	77 20.3	41 55.5	23.1	347 41.6	27.4	318 35.9	20.2	212 23.5	25.7	321 09.5	68	18 44.1 - 92
	14	92 22.8	56 55.1	24.2	2 42.3	27.4	333 37.9	20.1	227 26.1	25.7	335 35.3	69	18 34.9 - 93
	15	107 25.3	71 54.6	25.2	17 43.0	27.4	348 39.9	20.0	242 28.7	25.6	350 01.2	71	18 25.6 - 95
	16	122 27.7	86 54.2	26.2	32 43.6	27.4	3 41.9	20.0	257 31.4	25.6	4 27.3	71	18 16.1 - 95
	17	137 30.2	101 53.7	27.2	47 44.3	27.4	18 43.9	19.9	272 34.0	25.6	18 50.4	72	18 06.6 - 96
	18	152 32.7	116 53.3	+12 28.2	62 45.0	+24 27.4	33 45.9	+21 19.8	287 36.7	-14 25.5	33 19.6	74	+17 57.0 - 97
	19	167 35.1	131 52.9	29.2	77 45.6	27.4	48 48.0	19.7	302 39.3	25.5	47 46.0	75	17 47.3 - 98
	20	182 37.6	146 52.4	30.3	92 46.3	27.5	63 50.0	19.6	317 41.9	25.4	62 12.5	75	17 37.5 - 100
	21	197 40.0	161 52.0	31.3	107 47.0	27.5	78 52.0	19.6	332 44.6	25.4	76 39.0	77	17 27.5 - 100
	22	212 42.5	176 51.5	32.3	122 47.6	27.5	93 54.0	19.5	347 47.2	25.3	91 05.7	78	17 17.5 - 101
	23	227 45.0	191 51.0	33.3	137 48.3	27.5	108 56.0	19.4	2 49.8	25.3	105 32.5	79	17 07.4 - 102
26	0	242 47.4	206 50.6	+12 34.3	152 49.0	+24 27.5	123 58.0	+21 19.3	17 52.5	-14 25.2	119 59.4	81	+16 57.2 - 103
	1	257 49.9	221 50.1	35.3	167 49.6	27.5	139 00.0	19.2	32 55.1	25.2	134 26.5	81	16 46.9 - 103
	2	272 52.4	236 49.7	36.3	182 50.3	27.5	154 02.0	19.1	47 57.8	25.2	148 53.6	83	16 36.6 - 105
	3	287 54.8	251 49.2	37.3	197 50.9	27.5	169 04.0	19.1	63 00.4	25.1	163 20.9	83	16 26.1 - 105
	4	302 57.3	266 48.8	38.3	212 51.6	27.5	184 06.1	19.0	78 03.0	25.1	177 48.2	85	16 15.6 - 107
	5	317 59.8	281 48.3	39.4	227 52.3	27.6	199 08.1	18.9	93 05.7	25.0	192 15.7	86	16 04.9 - 107
	6	333 02.2	296 47.9	+12 40.4	242 52.9	+24 27.6	214 10.1	+21 18.8	108 08.3	-14 25.0	206 43.3	86	+15 54.2 - 107
	7	348 04.7	311 47.4	41.4	257 53.6	27.6	229 12.1	18.7	123 11.0	24.9	221 10.9	88	15 43.5 - 109
	8	3 07.2	326 47.0	42.4	272 54.3	27.6	244 14.1	18.7	138 13.6	24.9	235 38.7	89	15 32.6 - 109
	9	18 09.6	341 46.5	43.4	287 54.9	27.6	259 16.1	18.6	153 16.2	24.8	250 06.6	90	15 21.7 - 110
	10	33 12.1	356 46.1	44.4	302 55.6	27.6	274 18.1	18.5	168 18.9	24.8	264 34.6	92	15 10.7 - 111
	11	48 14.5	11 45.6	45.4	317 56.3	27.6	289 20.1	18.4	183 21.5	24.8	279 02.8	92	14 59.6 - 112
	12	63 17.0	26 45.2	+12 46.4	332 56.9	+24 27.6	304 22.1	+21 18.3	198 24.1	-14 24.7	293 31.0	93	+14 48.4 - 112
	13	78 19.5	41 44.7	47.4	347 57.6	27.6	319 24.1	18.2	213 26.8	24.7	307 59.3	94	14 37.2 - 113
	14	93 21.9	56 44.2	48.4	2 58.3	27.6	334 26.2	18.2	228 29.4	24.6	322 27.7	96	14 25.9 - 113
	15	108 24.4	71 43.8	49.4	17 58.9	27.6	349 28.2	18.1	243 32.1	24.6	336 56.3	96	14 14.6 - 115
	16	123 26.9	86 43.3	50.4	32 59.6	27.6	4 30.2	18.0	258 34.7	24.5	351 24.9	97	14 03.1 - 114
	17	138 29.3	101 42.9	51.4	48 00.3	27.6	19 32.2	17.9	273 37.3	24.5	5 53.6	99	13 51.7 - 116
	18	153 31.8	116 42.4	+12 52.4	63 00.9	+24 27.6	34 34.2	+21 17.8	288 40.0	-14 24.4	20 22.5	99	+13 40.1 - 116
	19	168 34.3	131 41.9	53.4	78 01.6	27.6	49 36.2	17.8	303 42.6	24.4	34 51.4	100	13 28.5 - 116
	20	183 36.7	146 41.5	54.4	93 02.3	27.6	64 38.2	17.7	318 45.2	24.4	49 20.4	102	13 16.9 - 118
	21	198 39.2	161 41.0	55.4	108 02.9	27.6	79 40.2	17.6	333 47.9	24.3	63 49.6	102	13 05.1 - 117
	22	213 41.6	176 40.6	56.4	123 03.6	27.6	94 42.2	17.5	348 50.5	24.3	78 18.8	103	12 53.4 - 119
	23	228 44.1	191 40.1	57.4	138 04.3	27.6	109 44.2	17.4	3 53.2	24.2	92 48.1	105	12 41.5 - 118
27	0	243 46.6	206 39.6	+12 58.4	153 04.9	+24 27.7	124 46.2	+21 17.3	18 55.8	-14 24.2	107 17.6	105	+12 29.7 - 120
	1	258 49.0	221 39.2	12 59.4	168 05.6	27.7	139 48.2	17.3	33 58.4	24.1	121 47.1	106	12 17.7 - 119
	2	273 51.5	236 38.7	13 00.4	183 06.2	27.7	154 50.2	17.2	49 01.1	24.1	136 16.7	107	12 05.8 - 121
	3	288 54.0	251 38.3	01.4	198 06.9	27.7	169 52.3	17.1	64 03.7	24.0	150 46.4	108	11 53.7 - 120
	4	303 56.4	266 37.8	02.4	213 07.6	27.7	184 54.3	17.0	79 06.3	24.0	165 16.2	109	11 41.7 - 122
	5	318 58.9	281 37.3	03.4	228 08.2	27.7	199 56.3	16.9	94 09.0	24.0	179 46.1	110	11 29.5 - 121
	6	334 01.4	296 36.9	+13 04.4	243 08.9	+24 27.7	214 58.3	+21 16.8	109 11.6	-14 23.9	194 16.1	111	+11 17.4 - 122
	7	349 03.8	311 36.4	05.4	258 09.6	27.7	230 00.3	16.8	124 14.2	23.9	208 46.2	111	11 05.2 - 123
	8	4 06.3	326 35.9	06.4	273 10.2	27.7	245 02.3	16.7	139 16.9	23.8	223 16.3	113	10 52.9 - 123
	9	19 08.8	341 35.5	07.4	288 10.9	27.7	260 04.3	16.6	154 19.5	23.8	237 46.6	113	10 40.6 - 123
	10	34 11.2	356 35.0	08.4	303 11.6	27.7	275 06.3	16.5	169 22.2	23.7	252 16.9	115	10 28.3 - 123
	11	49 13.7	11 34.5	09.4	318 12.2	27.7	290 08.3	16.4	184 24.8	23.7	266 47.4	115	10 16.0 - 124
	12	64 16.1	26 34.1	+13 10.4	333 12.9	+24 27.6	305 10.3	+21 16.3	199 27.4	-14 23.7	281 17.9	116	+10 03.6 - 125
	13	79 18.6	41 33.6	11.4	348 13.6	27.6	320 12.3	16.3	214 30.1	23.6	295 48.5	116	9 51.1 - 124
	14	94 21.1	56 33.1	12.4	3 14.2	27.6	335 14.3	16.2	229 32.7	23.6	310 19.1	118	9 38.7 - 125
	15	109 23.5	71 32.7	13.4	18 14.9	27.6	350 16.3	16.1	244 35.3	23.5	324 49.9	118	9 26.2 - 125
	16	124 26.0	86 32.2	14.4	33 15.6	27.6	5 18.3	16.0	259 38.0	23.5	339 20.7	119	9 13.7 - 126
	17	139 28.5	101 31.7	15.4	48 16.2	27.6	20 20.3	15.9	274 40.6	23.4	353 51.6	120	9 01.1 - 126
	18	154 30.9	116 31.3	+13 16.4	63 16.9	+24 27.6	35 22.3	+21 15.8	289 43.2	-14 23.4	8 22.6	121	+ 8 48.5 - 126
	19	169 33.4	131 30.8	17.4	78 17.6	27.6	50 24.3	15.8	304 45.9	23.3	22 53.7	122	8 35.9 - 126
	20	184 35.9	146 30.3	18.3	93 18.2	27.6	65 26.3	15.7	319 48.5	23.3	37 24.9	122	8 23.3 - 127
	21	199 38.3	161 29.9	19.3	108 18.9	27.6	80 28.3	15.6	334 51.2	23.3	51 56.1	123	8 10.6 - 127
	22	214 40.8	176 29.4	20.3	123 19.6	27.6	95 30.4	15.5					

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS				
	GHA	Dec.	No.	Name	SHA	Dec.								Alt.	Sun's Low'r Limb Add	Venus Add	Mars Add	
	h	°			°	°	N	h	m	h	m	h	m					h
25	0	180 49.3	+20 46.1	7	Acamar	315 51.7	-40 28.8	72	□	□	□	6 14	8 48	10 55	Alt.			
	1	195 49.2	46.6	5	Achernar	335 59.5	-57 27.5	70	□	□	□	6 55	9 07	11 03				
	2	210 49.2	47.0	30	Acrux	173 57.8	-62 51.5	68	0 29	///	///	5 07	7 23	9 21				
	3	225 49.1	47.5	19	Adhara	255 47.0	-28 54.8	66	1 40	///	///	5 46	7 44	9 33				
	4	240 49.0	48.0	10	Aldebaran	291 39.7	+16 25.3	64	2 16	///	///	6 13	8 00	9 42				
	5	255 49.0	48.4					62	2 41	///	///	6 33	8 14	9 50				
	6	270 48.9	+20 48.9	32	Alioth	166 58.4	+56 12.2	60	3 01	///	///	6 50	8 25	9 57				
	7	285 48.9	49.3	34	Alkaid	153 32.7	+49 32.2	58	3 17	///	///	7 04	8 35	10 03				
	8	300 48.8	49.8	55	Al Na'ir	28 38.2	-47 10.4	56	3 30	///	///	7 16	8 44	10 09				
	9	315 48.8	50.3	15	Alnilam	276 30.8	-1 13.8	54	3 42	///	///	7 27	8 51	10 14				
	10	330 48.7	50.7	25	Alphard	218 38.9	-8 28.1	52	3 52	///	///	7 36	8 58	10 18				
	11	345 48.6	51.2					50	4 02	0 53	7 44	9 04	10 22	11 36				
	12	0 48.6	+20 51.6	41	Alphecca	126 47.5	+26 51.8	45	4 21	2 04	8 02	9 18	10 31	11 40	Moon's Lower Limb			
	13	15 48.5	52.1	1	Alpheratz	358 28.8	+28 50.6	40	4 37	2 41	8 17	9 28	10 38	11 44	Add			
	14	30 48.5	52.5	51	Altair	62 50.4	+8 44.9	35	4 50	3 08	8 29	9 38	10 44	11 47	Alt.	25	26	27
	15	45 48.4	53.0	2	Ankaa	353 58.7	-42 32.6	30	5 01	3 29	8 39	9 46	10 49	11 49	°			
	16	60 48.3	53.4	42	Antares	113 19.3	-26 20.2	20	5 21	3 59	8 57	10 00	10 58	11 54	0			
	17	75 48.3	53.9					10	5 38	4 22	9 13	10 12	11 06	11 57	4	19.0	18.0	16.7
	18	90 48.2	+20 54.3	37	Arcturus	146 35.1	+19 24.8	0	5 53	4 39	9 28	10 23	11 14	12 01	8	19.0	18.0	16.7
	19	105 48.2	54.8	43	Atria	108 59.7	-68 57.0	10	6 09	4 55	9 43	10 34	11 21	12 05	12	18.9	17.9	16.7
	20	120 48.1	55.3	22	Avior	234 36.2	-59 22.3	20	6 25	5 08	9 58	10 46	11 29	12 09	16	18.9	17.9	16.7
	21	135 48.0	55.7	13	Bellatrix	279 19.0	+6 18.6	30	6 44	5 19	10 16	11 00	11 39	12 13	20	18.9	17.9	16.7
	22	150 48.0	56.2	16	Betelge'se	271 48.7	+7 24.0	35	6 55	5 25	10 27	11 08	11 44	12 16	24	18.8	17.8	16.6
	23	165 47.9	56.6					40	7 07	5 31	10 38	11 17	11 50	12 18	28	18.7	17.8	16.6
				17	Canopus	264 16.0	-52 40.4	45	7 22	5 37	10 52	11 27	11 56	12 22	32	18.6	17.7	16.6
				12	Capella	281 39.3	+45 57.3	50	7 40	5 42	11 09	11 40	12 05	12 26	36	18.5	17.6	16.5
				53	Deneb	50 01.0	+45 07.0	52	7 48	5 46	11 17	11 46	12 08	12 27	40	18.4	17.6	16.5
				28	Denebola	183 17.9	+14 49.2	54	7 58	5 48	11 26	11 52	12 13	12 29	44	18.3	17.5	16.5
				4	Diphda	349 39.7	-18 13.7	56	8 08	5 51	11 36	11 59	12 17	12 31	48	18.2	17.4	16.4
				48	Kaus Aust.	84 41.1	-34 24.4	64	8 20	5 54	11 47	12 07	12 22	12 34	52	18.0	17.3	16.4
								58	8 34	5 56	12 00	12 16	12 28	12 37	56	17.9	17.2	16.3
				27	Dubhe	194 44.7	+61 59.7	60	S						60	17.7	17.1	16.3
				14	Elnath	279 08.0	+28 34.3								64	17.6	17.0	16.2
				47	Eltanin	91 05.9	+51 29.5	Lat.	Sunset	Twlt. ends	Moonset				64	17.4	16.8	16.2
				54	Enif	34 29.8	+9 40.2	N.	h	m	h	m	h	m	h	m	h	m
				56	Fomalhaut	16 11.9	-29 51.3		h	m	h	m	h	m	h	m	h	m
				31	Gacrux	172 49.2	-56 52.2	72	□	□	□	2 25	1 38	1 11	76	17.0	16.6	16.0
				29	Gienah	176 37.0	-17 17.9	70	□	□	□	1 42	1 18	1 01	80	16.8	16.5	16.0
				35	Hadar	149 49.3	-60 09.8	68	23 47	///	///	1 31	1 13	1 01	84	16.7	16.3	15.9
				6	Hamal	328 50.2	+23 15.1	66	22 17	///	///	0 51	0 51	0 48	88	16.5	16.2	15.9
				48	Kaus Aust.	84 41.1	-34 24.4	64	21 40	///	///	0 24	0 33	0 37	90	16.3	16.1	15.8
								62	21 15	///	///	0 02	0 19	0 28	Add to table, back cover			
				40	Kochab	137 16.7	+74 20.3	60	20 55	///	///	24 06	0 06	0 20	Moon's Upper Limb			
				57	Markab	14 21.8	+14 57.9	58	20 38	///	///	23 55	24 13	0 13	Subtract			
				8	Menkar	315 00.9	+3 55.0	56	20 25	///	///	23 46	24 06	0 06	Alt.	25	26	27
				36	Menkent	148 58.6	-36 09.3	54	20 13	///	///	23 38	24 01	0 01	0			
				24	Miapl'dus	221 49.4	-69 32.4	52	20 02	///	///	23 30	23 56	24 16	4	13.6	14.2	14.9
								50	19 53	23 07	23 23	23 51	24 14	0 14	8	13.6	14.2	14.9
				9	Mirfak	309 43.2	+49 42.2	45	19 33	21 52	23 09	23 41	24 08	0 08	12	13.6	14.2	14.9
				50	Nunki	76 51.9	-26 21.2	40	19 18	21 14	22 57	23 32	24 03	0 03	16	13.7	14.2	14.9
				52	Peacock	54 27.3	-56 52.5	35	19 04	20 46	22 47	23 25	23 59	24 29	20	13.7	14.3	14.9
				21	Pollux	244 21.1	+28 08.1	30	18 53	20 26	22 37	23 18	23 55	24 28	24	13.8	14.3	15.0
				20	Procyon	245 45.5	+5 20.4	20	18 33	19 55	22 22	23 07	23 48	24 26	28	13.9	14.4	15.0
								10	18 16	19 32	22 08	22 57	23 42	24 24	32	13.9	14.4	15.0
				46	R'alhague	96 46.5	+12 35.4	0	18 00	19 14	21 55	22 48	23 37	24 23	36	14.0	14.5	15.0
				26	Regulus	208 29.8	+12 11.1	10	17 45	18 59	21 42	22 38	23 31	24 21	40	14.2	14.6	15.1
				11	Rigel	281 54.2	-8 15.2	20	17 29	18 46	21 28	22 28	23 25	24 19	44	14.3	14.7	15.1
				38	Rigel Kent.	140 50.7	-60 39.4	30	17 10	18 34	21 11	22 16	23 18	24 17	48	14.4	14.7	15.2
				44	Sabik	103 02.1	-15 40.3	35	16 59	18 28	21 02	22 10	23 14	24 16	52	14.5	14.8	15.2
								40	16 46	18 22	20 51	22 02	23 10	24 14	56	14.7	15.0	15.3
				3	Schedar	350 30.6	+56 17.4	45	16 32	18 16	20 38	21 53	23 04	24 13	60	14.9	15.1	15.3
				45	Shaula	97 20.6	-37 04.4	50	16 14	18 10	20 22	21 42	22 58	24 11	64	15.0	15.2	15.4
				18	Sirius	259 12.4	-16 39.3	52	16 05	18 07	20 15	21 36	22 55	24 10	68	15.2	15.3	15.4
				33	Spica	159 16.9	-10 55.9	54	15 56	18 04	20 07	21 31	22 52	24 09	72	15.4	15.4	15.5
				23	Suhail	223 24.7	-43 15.4	56	15 45	18 01	19 57	21 24	22 48	24 08	76	15.5	15.5	15.5
								58	15 33	17 59	19 47	21 17	22 44	24 06	80	15.7	15.7	15.6
				49	Vega	81 08.1	+38 44.3	60	15 19	17 56	19 34	21 09	22 39	24 05	84	15.9	15.8	15.7
				39	Zub'g'bi	137 53.3	-15 51.6	S							88	16.1	15.9	15.7
															90	16.2	16.0	15.8
				G M T	Equation of Time (App.--Mean)			GMT of Transit Meridian of Greenwich										
					25	26	27	DAY	Moon	Venus	Mars	Jupiter	Saturn	Subtract from table, back cover				
				h	m	s	m	s	h	m	h	m	h	m	h	m	h	m
				0	+ 3 17.2	+ 3 11.5	+ 3 05.3	25	15 42	10 12	13 49	15 45	22 49					
				6	+ 3 15.8	+ 3 10.0	+ 3 03.7	26	16 36	10 13	13 48	15 42	22 45					

G M T	T		VENUS — 3.3				MARS 1.9				JUPITER — 1.5				SATURN 0.4				MOON				
	GHA		GHA	Dec.			GHA	Dec.			GHA	Dec.			GHA	Dec.			GHA	code	Dec.		code
28	h	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
	0	244 45.7	206 28.5	+13 22.3	153 20.9	+24 27.6	125 34.4	+21 15.3	19 59.1	-14 23.1	95 30.2	125 +	7 32.5	-127									
	1	259 48.2	221 28.0	23.3	168 21.6	27.6	140 36.4	15.3	35 01.7	23.1	110 01.7	126	7 19.8	-128									
	2	274 50.6	236 27.5	24.3	183 22.2	27.6	155 38.4	15.2	50 04.3	23.0	124 33.3	126	7 07.0	-128									
	3	289 53.1	251 27.0	.. 25.3	198 22.9	.. 27.6	170 40.4	.. 15.1	65 07.0	.. 23.0	139 04.9	127	· 6 54.2	-128									
	4	304 55.6	266 26.6	26.3	213 23.6	27.6	185 42.4	15.0	80 09.6	23.0	153 36.6	128	6 41.4	-128									
	5	319 58.0	281 26.1	27.2	228 24.2	27.6	200 44.4	14.9	95 12.2	22.9	168 08.4	129	6 28.6	-128									
	6	335 00.5	296 25.6	+13 28.2	243 24.9	+24 27.6	215 46.4	+21 14.8	110 14.9	-14 22.9	182 40.3	129	+	6 15.8	-129								
	7	350 03.0	311 25.2	29.2	258 25.6	27.5	230 48.4	14.8	125 17.5	22.8	197 12.2	129	6 02.9	-129									
	8	5 05.4	326 24.7	30.2	273 26.2	27.5	245 50.4	14.7	140 20.1	22.8	211 44.1	131	5 50.1	-129									
	9	20 07.9	341 24.2	.. 31.2	288 26.9	.. 27.5	260 52.4	.. 14.6	155 22.8	.. 22.7	226 16.2	131	· 5 37.2	-129									
	10	35 10.4	356 23.7	32.2	303 27.6	27.5	275 54.4	14.5	170 25.4	22.7	240 48.3	131	5 24.3	-129									
	11	50 12.8	11 23.3	33.1	318 28.3	27.5	290 56.4	14.4	185 28.0	22.7	255 20.4	132	5 11.4	-129									
	12	65 15.3	26 22.8	+13 34.1	333 28.9	+24 27.5	305 58.4	+21 14.3	200 30.7	-14 22.6	269 52.6	133	+	4 58.5	-129								
	13	80 17.8	41 22.3	35.1	348 29.6	27.5	321 00.4	14.2	215 33.3	22.6	284 24.9	133	4 45.6	-129									
	14	95 20.2	56 21.8	36.1	3 30.3	27.5	336 02.4	14.2	230 36.0	22.5	298 57.2	134	4 32.7	-129									
	15	110 22.7	71 21.3	.. 37.1	18 30.9	.. 27.5	351 04.4	.. 14.1	245 38.6	.. 22.5	313 29.6	134	· 4 19.8	-129									
	16	125 25.1	86 20.9	38.0	33 31.6	27.4	6 06.4	14.0	260 41.2	22.4	328 02.0	135	4 06.9	-129									
	17	140 27.6	101 20.4	39.0	48 32.3	27.4	21 08.4	13.9	275 43.9	22.4	342 34.5	136	3 54.0	-129									
	18	155 30.1	116 19.9	+13 40.0	63 32.9	+24 27.4	36 10.4	+21 13.8	290 46.5	-14 22.4	357 07.1	135	+	3 41.1	-130								
	19	170 32.5	131 19.4	41.0	78 33.6	27.4	51 12.4	13.7	305 49.1	22.3	11 39.6	137	3 28.1	-129									
	20	185 35.0	146 19.0	42.0	93 34.3	27.4	66 14.4	13.7	320 51.8	22.3	26 12.3	137	3 15.2	-129									
	21	200 37.5	161 18.5	.. 42.9	108 34.9	.. 27.4	81 16.4	.. 13.6	335 54.4	.. 22.2	40 45.0	137	· 3 02.3	-129									
	22	215 39.9	176 18.0	43.9	123 35.6	27.4	96 18.4	13.5	350 57.0	22.2	55 17.7	138	2 49.4	-129									
	23	230 42.4	191 17.5	44.9	138 36.3	27.4	111 20.4	13.4	5 59.7	22.1	69 50.5	138	2 36.5	-130									
29	0	245 44.9	206 17.0	+13 45.9	153 36.9	+24 27.3	126 22.4	+21 13.3	21 02.3	-14 22.1	84 23.3	138	+	2 23.5	-129								
	1	260 47.3	221 16.6	46.8	168 37.6	27.3	141 24.4	13.2	36 04.9	22.1	98 56.1	139	2 10.6	-129									
	2	275 49.8	236 16.1	47.8	183 38.3	27.3	156 26.4	13.1	51 07.6	22.0	113 29.0	140	1 57.7	-129									
	3	290 52.2	251 15.6	.. 48.8	198 38.9	.. 27.3	171 28.4	.. 13.1	66 10.2	.. 22.0	128 02.0	140	· 1 44.8	-129									
	4	305 54.7	266 15.1	49.8	213 39.6	27.3	186 30.4	13.0	81 12.8	21.9	142 35.0	140	1 31.9	-128									
	5	320 57.2	281 14.6	50.7	228 40.3	27.3	201 32.4	12.9	96 15.5	21.9	157 08.0	141	1 19.1	-129									
	6	335 59.6	296 14.1	+13 51.7	243 40.9	+24 27.3	216 34.4	+21 12.8	111 18.1	-14 21.8	171 41.1	141	+	1 06.2	-129								
	7	351 02.1	311 13.7	52.7	258 41.6	27.2	231 36.4	12.7	126 20.7	21.8	186 14.2	141	0 53.3	-128									
	8	6 04.6	326 13.2	53.6	273 42.3	27.2	246 38.4	12.6	141 23.4	21.8	200 47.3	142	0 40.5	-129									
	9	21 07.0	341 12.7	.. 54.6	288 43.0	.. 27.2	261 40.4	.. 12.5	156 26.0	.. 21.7	215 20.5	142	· 0 27.6	-128									
	10	36 09.5	356 12.2	55.6	303 43.6	27.2	276 42.4	12.5	171 28.6	21.7	229 53.7	142	0 14.8	-128									
	11	51 12.0	11 11.7	56.6	318 44.3	27.2	291 44.4	12.4	186 31.3	21.6	244 26.9	143	+	0 02.0	-129								
	12	66 14.4	26 11.2	+13 57.5	333 45.0	+24 27.1	306 46.4	+21 12.3	201 33.9	-14 21.6	259 00.2	143	-	0 10.9	-127								
	13	81 16.9	41 10.7	58.5	348 45.6	27.1	321 48.4	12.2	216 36.5	21.5	273 33.5	143	0 23.6	-128									
	14	96 19.4	56 10.3	13 59.5	3 46.3	27.1	336 50.4	12.1	231 39.2	21.5	288 06.8	144	0 36.4	-128									
	15	111 21.8	71 09.8	-14 00.4	18 47.0	.. 27.1	351 52.4	.. 12.0	246 41.8	.. 21.5	302 40.2	144	· 0 49.2	-127									
	16	126 24.3	86 09.3	01.4	33 47.6	27.1	6 54.4	11.9	261 44.4	21.4	317 13.6	144	1 01.9	-128									
	17	141 26.7	101 08.8	02.4	48 48.3	27.0	21 56.4	11.9	276 47.1	21.4	331 47.0	144	1 14.7	-127									
	18	156 29.2	116 08.3	+14 03.3	63 49.0	+24 27.0	36 58.4	+21 11.8	291 49.7	-14 21.3	346 20.4	145	-	1 27.4	-127								
	19	171 31.7	131 07.8	04.3	78 49.6	27.0	52 00.4	11.7	306 52.3	21.3	0 53.9	144	1 40.1	-126									
	20	186 34.1	146 07.3	05.3	93 50.3	27.0	67 02.4	11.6	321 54.9	21.2	15 27.3	145	1 52.7	-127									
	21	201 36.6	161 06.8	.. 06.2	108 51.0	.. 27.0	82 04.4	.. 11.5	336 57.6	.. 21.2	30 00.8	146	· 2 05.4	-126									
	22	216 39.1	176 06.4	07.2	123 51.7	26.9	97 06.4	11.4	352 00.2	21.2	44 34.4	145	2 18.0	-126									
	23	231 41.5	191 05.9	08.1	138 52.3	26.9	112 08.4	11.3	7 02.8	21.1	59 07.9	146	2 30.6	-126									
30	0	246 44.0	206 05.4	+14 09.1	153 53.0	+24 26.9	127 10.4	+21 11.3	22 05.5	-14 21.1	73 41.5	146	-	2 43.2	-125								
	1	261 46.5	221 04.9	10.1	168 53.7	26.9	142 12.4	11.2	37 08.1	21.0	88 15.1	146	2 55.7	-126									
	2	276 48.9	236 04.4	11.0	183 54.3	26.8	157 14.4	11.1	52 10.7	21.0	102 48.7	146	3 08.3	-125									
	3	291 51.4	251 03.9	.. 12.0	198 55.0	.. 26.8	172 16.3	.. 11.0	67 13.4	.. 21.0	117 22.3	146	· 3 20.8	-125									
	4	306 53.9	266 03.4	12.9	213 55.7	26.8	187 18.3	10.9	82 16.0	20.9	131 55.9	146	3 33.3	-124									
	5	321 56.3	281 02.9	13.9	228 56.3	26.8	202 20.3	10.8	97 18.6	20.9	146 29.5	147	3 45.7	-124									
	6	336 58.8	296 02.4	+14 14.9	243 57.0	+24 26.7	217 22.3	+21 10.7	112 21.3	-14 20.8	161 03.2	147	-	3 58.1	-124								
	7	352 01.2	311 01.9	15.8	258 57.7	26.7	232 24.3	10.7	127 23.9	20.8	175 36.9	147	4 10.5	-124									
	8	7 03.7	326 01.4	16.8	273 58.3	26.7	247 26.3	10.6	142 26.5	20.7	190 10.6	146	4 22.9	-124									
	9	22 06.2	341 00.9	.. 17.7	288 59.0	.. 26.7	262 28.3	.. 10.5	157 29.2	.. 20.7	204 44.2	147	· 4 35.3	-123									
	10	37 08.6	356 00.4	18.7	303 59.7	26.6	277 30.3	10.4	172 31.8	20.7	219 17.9	147	4 47.6	-123									
	11	52 11.1	10 59.9	19.7	319 00.4	26.6	292 32.3	10.3	187 34.4	20.6	233 51.6	148	4 59.9	-122									
	12	67 13.6	25 59.4	+14 20.6	334 01.0	+24 26.6	307 34.3	+21 10.2	202 37.0	-14 20.6	248 25.4	147	-	5 12.1	-122								
	13	82 16.0	40 58.9	21.6	349 01.7	26.6	322 36.3	10.1	217 39.7	20.5	262 59.1	147	5 24.3	-122									
	14	97 18.5	55 58.5	22.5	4 02.4	26.5	337 38.3	10.0	232 42.3	20.5	277 32.8	147	5 36.5	-122									
	15	112 21.0	70 58.0	.. 23.5	19 03.0	.. 26.5	352 40.3	.. 10.0	247 44.9	.. 20.4	292 06.5	148	· 5 48.7	-121									
	16	127 23.4	85 57.5	24.4	34 03.7	26.5	7 42.3	09.9	262 47.6	20.4	306 40.3	147	6 00.8	-120									
	17	142 25.9	100 57.0	25.4	49 04.4	26.4	22 44.3	09.8	277 50.2	20.4	321 14.0	148	6 12.8	-121									
	18	157 28.3	115 56.5	+14 26.3	64 05.1	+24 26.4	37 46.3	+21 09.7	292 52.8	-14 20.3	335 47.8	147	-	6									

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.	No.	Name	SHA	Dec.													
										28	29	30	31	Alt.	Sun's Low'r Limb	Venus	Mars		
h	°	'	°	'	°	'	N	h	m	h	m	h	m	h	m	°	'	'	'
28	0	180 44.6	+21	17.9	7 Acamar	315 51.7	-40 28.8	72	□	□	10 55	12 52	14 45	16 42		Alt.	Sun's Low'r Limb	Venus	Mars
	1	195 44.6		18.3	5 Achernar	335 59.4	-57 27.5	70	□	□	11 03	12 51	14 36	16 23		Add	Add	Add	Add
	2	210 44.5		18.7	30 Acrux	173 57.8	-62 51.5	68	□	□	11 09	12 50	14 29	16 08					
	3	225 44.4	..	19.1	19 Adhara	255 47.0	-28 54.8	66	1 28	////	11 14	12 50	14 23	15 56					
	4	240 44.3		19.5	10 Aldebaran	291 39.7	+16 25.3	64	2 07	////	11 18	12 49	14 18	15 46		0	0.1	0.1	0.1
	5	255 44.3		19.9				62	2 34	////	11 22	12 49	14 14	15 38		30	0.1	0.1	0.0
	6	270 44.2	+21	20.4	32 Alioth	166 58.4	+56 12.2	60	2 55	////	11 25	12 49	14 10	15 31		45	0.1	0.1	0.0
	7	285 44.1		20.8	34 Alkaid	153 32.7	+49 32.2	58	3 12	////	11 28	12 49	14 07	15 25		60	0.1	0.0	0.0
	8	300 44.1		21.2	55 Al Na'ir	28 38.2	-47 10.4	56	3 26	////	11 30	12 48	14 04	15 19		75	0.1	0.0	0.0
	9	315 44.0	..	21.6	15 Alnilam	276 30.8	- 1 13.8	54	3 39	////	11 33	12 48	14 02	15 14		90	0.1	0.0	0.0
	10	330 43.9		22.0	25 Alphard	218 38.9	- 8 28.1	52	3 49	////	11 35	12 48	13 59	15 10					
	11	345 43.8		22.4				50	3 59	0 37	11 36	12 48	13 57	15 05					
	12	0 43.8	+21	22.8	41 Alphecca	126 47.5	+26 51.8	45	4 19	2 00	11 40	12 48	13 53	14 57		Moon's Lower Limb			
	13	15 43.7		23.2	1 Alpheratz	358 28.7	+28 50.6	40	4 35	2 39	11 44	12 47	13 49	14 49		Add			
	14	30 43.6		23.6	51 Altair	62 50.4	+ 8 44.9	35	4 49	3 06	11 47	12 47	13 46	14 43		Alt.	28	29	30
	15	45 43.5	..	24.1	2 Ankaa	353 58.7	-42 32.6	30	5 00	3 27	11 49	12 47	13 43	14 38		0			
	16	60 43.5		24.5	42 Antares	113 19.3	-26 20.2	20	5 20	3 59	11 54	12 46	13 38	14 28		4	15.7	14.7	13.8
	17	75 43.4		24.9				10	5 38	4 22	11 57	12 46	13 33	14 20		8	15.7	14.7	13.8
	18	90 43.3	+21	25.3	37 Arcturus	146 35.1	+19 24.8	0	5 54	4 39	12 01	12 46	13 29	14 13		12	15.7	14.7	13.8
	19	105 43.2		25.7	43 Atria	108 59.7	-68 57.0	10	6 10	4 55	12 05	12 46	13 25	14 05		16	15.7	14.7	13.8
	20	120 43.2		26.1	22 Avior	234 36.3	-59 22.3	20	6 26	5 08	12 09	12 45	13 21	13 57		20	15.7	14.7	13.8
	21	135 43.1	..	26.5	13 Bellatrix	279 19.0	+ 6 18.6	30	6 46	5 21	12 13	12 45	13 16	13 48		24	15.7	14.7	13.9
	22	150 43.0		26.9	16 Betelge'se	271 48.7	+ 7 24.0	35	6 57	5 27	12 16	12 45	13 14	13 43		28	15.7	14.8	14.0
	23	165 42.9		27.3				40	7 10	5 33	12 18	12 45	13 11	13 37		32	15.7	14.8	14.0
					17 Canopus	264 16.0	-52 40.4	45	7 25	5 39	12 22	12 45	13 07	13 30		36	15.7	14.8	14.0
					12 Capella	281 39.3	+45 57.3	50	7 43	5 46	12 26	12 44	13 03	13 22		40	15.7	14.8	14.1
					53 Deneb	50 00.9	+45 07.1	52	7 52	5 49	12 27	12 44	13 01	13 18		44	15.7	14.8	14.1
					28 Denebola	183 17.9	+14 49.2	54	8 02	5 51	12 29	12 44	12 59	13 14		48	15.6	14.9	14.2
					4 Diphda	349 39.7	-18 13.7	56	8 13	5 54	12 31	12 44	12 57	13 10		52	15.6	14.9	14.3
								58	8 26	5 57	12 34	12 44	12 54	13 05		56	15.6	15.0	14.4
								60	8 40	6 00	12 37	12 44	12 51	12 59		60	15.6	15.0	14.5
								S								64	15.6	15.1	14.6
																68	15.6	15.1	14.7
																72	15.6	15.2	14.8
																76	15.6	15.2	14.9
																80	15.6	15.3	15.0
																84	15.6	15.3	15.1
																88	15.6	15.3	15.1
																90	15.6	15.3	15.1
																Add to table, back cover			
																Moon's Upper Limb			
																Subtract			
																Alt.	28	29	30
																0			
																4	15.5	16.1	16.6
																8	15.5	16.0	16.5
																12	15.5	16.0	16.5
																16	15.5	16.0	16.5
																20	15.5	16.0	16.5
																24	15.5	16.0	16.4
																28	15.5	16.0	16.4
																32	15.5	16.0	16.4
																36	15.5	15.9	16.3
																40	15.5	15.9	16.3
																44	15.5	15.9	16.2
																48	15.5	15.8	16.1
																52	15.5	15.8	16.1
																56	15.5	15.8	16.0
																60	15.5	15.7	15.9
																64	15.5	15.7	15.8
																68	15.5	15.6	15.7
																72	15.5	15.6	15.6
																76	15.6	15.5	15.5
																80	15.6	15.5	15.4
																84	15.6	15.4	15.3
																88	15.6	15.4	15.2
																90	15.6	15.4	15.2
																Subtract from table, back cover			
																DAY	Moon	Venus	Mars
																h m	h m	h m	h m
																28	18 12	10 14	13 46
																29	18 56	10 15	13 45
																30	19 40	10 16	13 44
																31	20 23	10 17	13 43
									</										

G M T	VENUS - 3.3		MARS 1.9		JUPITER - 1.5		SATURN 0.4		MOON			
	GHA	GHA Dec.	GHA Dec.	GHA Dec.	GHA Dec.	GHA Dec.	GHA Dec.	GHA	code	Dec.	code	
31 ^h	247 43.1	205 53.5 +14 32.0	154 09.1 +24 26.2	127 58.2 +21 09.2	23 08.6 -14 20.1	63 10.2 147 - 7 36.4 -117						
1	262 45.6	220 53.0 33.0	169 09.7 26.2	143 00.2 09.1	38 11.2 20.0	77 43.9 147 7 48.1 -118						
2	277 48.1	235 52.5 33.9	184 10.4 26.2	158 02.2 09.0	53 13.9 20.0	92 17.6 147 7 59.9 -117						
3	292 50.5	250 51.9 34.9	199 11.1 26.1	173 04.2 08.9	68 16.5 20.0	106 51.3 147 8 11.6 -116						
4	307 53.0	265 51.4 35.8	214 11.8 26.1	188 06.2 08.8	83 19.1 19.9	121 25.0 147 8 23.2 -116						
5	322 55.5	280 50.9 36.8	229 12.4 26.1	203 08.2 08.7	98 21.8 19.9	135 58.7 147 8 34.8 -116						
6	337 57.9	295 50.4 +14 37.7	244 13.1 +24 26.0	218 10.2 +21 08.7	113 24.4 -14 19.8	150 32.4 147 - 8 46.4 -115						
7	353 00.4	310 49.9 38.6	259 13.8 26.0	233 12.2 08.6	128 27.0 19.8	165 06.1 147 8 57.9 -115						
8	8 02.8	325 49.4 39.6	274 14.4 26.0	248 14.2 08.5	143 29.6 19.7	179 39.8 147 9 09.4 -114						
9	23 05.3	340 48.9 40.5	289 15.1 25.9	263 16.2 08.4	158 32.3 19.7	194 13.5 146 9 20.8 -114						
10	38 07.8	355 48.4 41.5	304 15.8 25.9	278 18.2 08.3	173 34.9 19.7	208 47.1 146 9 32.2 -113						
11	53 10.2	10 47.9 42.4	319 16.5 25.9	293 20.2 08.2	188 37.5 19.6	223 20.7 147 9 43.5 -113						
12	68 12.7	25 47.4 +14 43.4	334 17.1 +24 25.8	308 22.1 +21 08.1	203 40.2 -14 19.6	237 54.4 146 - 9 54.8 -112						
13	83 15.2	40 46.9 44.3	349 17.8 25.8	323 24.1 08.0	218 42.8 19.5	252 28.0 146 10 06.0 -112						
14	98 17.6	55 46.4 45.2	4 18.5 25.8	338 26.1 08.0	233 45.4 19.5	267 01.6 146 10 17.2 -111						
15	113 20.1	70 45.9 46.2	19 19.2 25.7	353 28.1 07.9	248 48.1 19.5	281 35.2 145 10 28.3 -111						
16	128 22.6	85 45.4 47.1	34 19.8 25.7	8 30.1 07.8	263 50.7 19.4	296 08.7 146 10 39.4 -110						
17	143 25.0	100 44.9 48.1	49 20.5 25.7	23 32.1 07.7	278 53.3 19.4	310 42.3 145 10 50.4 -110						
18	158 27.5	115 44.4 +14 49.0	64 21.2 +24 25.6	38 34.1 +21 07.6	293 55.9 -14 19.3	325 15.8 145 -11 01.4 -110						
19	173 30.0	130 43.8 49.9	79 21.8 25.6	53 36.1 07.5	308 58.6 19.3	339 49.3 145 11 12.4 -108						
20	188 32.4	145 43.3 50.9	94 22.5 25.5	68 38.1 07.4	324 01.2 19.3	354 22.8 145 11 23.2 -109						
21	203 34.9	160 42.8 51.8	109 23.2 25.5	83 40.1 07.3	339 03.8 19.2	8 56.3 145 11 34.1 -107						
22	218 37.3	175 42.3 52.7	124 23.9 25.5	98 42.1 07.2	354 06.4 19.2	23 29.8 144 11 44.8 -107						
23	233 39.8	190 41.8 53.7	139 24.5 25.4	113 44.0 07.2	9 09.1 19.1	38 03.2 144 11 55.5 -107						
1 ⁰	248 42.3	205 41.3 +14 54.6	154 25.2 +24 25.4	128 46.0 +21 07.1	24 11.7 -14 19.1	52 36.6 144 -12 06.2 -106						
1	263 44.7	220 40.8 55.5	169 25.9 25.4	143 48.0 07.0	39 14.3 19.1	67 10.0 144 12 16.8 -105						
2	278 47.2	235 40.3 56.5	184 26.6 25.3	158 50.0 06.9	54 17.0 19.0	81 43.4 143 12 27.3 -105						
3	293 49.7	250 39.7 57.4	199 27.2 25.3	173 52.0 06.8	69 19.6 19.0	96 16.7 143 12 37.8 -104						
4	308 52.1	265 39.2 58.3	214 27.9 25.2	188 54.0 06.7	84 22.2 18.9	110 50.0 143 12 48.2 -104						
5	323 54.6	280 38.7 14 59.3	229 28.6 25.2	203 56.0 06.6	99 24.8 18.9	125 23.3 143 12 58.6 -103						
6	338 57.1	295 38.2 +15 00.2	244 29.2 +24 25.1	218 58.0 +21 06.5	114 27.5 -14 18.8	139 56.6 143 -13 08.9 -103						
7	353 59.5	310 37.7 01.1	259 29.9 25.1	234 00.0 06.5	129 30.1 18.8	154 29.9 142 13 19.2 -101						
8	9 02.0	325 37.2 02.1	274 30.6 25.1	249 02.0 06.4	144 32.7 18.8	169 03.1 142 13 29.3 -102						
9	24 04.4	340 36.7 03.0	289 31.3 25.0	264 03.9 06.3	159 35.4 18.7	183 36.3 142 13 39.5 -100						
10	39 06.9	355 36.1 03.9	304 31.9 25.0	279 05.9 06.2	174 38.0 18.7	198 09.5 141 13 49.5 -100						
11	54 09.4	10 35.6 04.8	319 32.6 24.9	294 07.9 06.1	189 40.6 18.6	212 42.6 141 13 59.5 -100						
12	69 11.8	25 35.1 +15 05.8	334 33.3 +24 24.9	309 09.9 +21 06.0	204 43.2 -14 18.6	227 15.7 141 -14 09.5 -98						
13	84 14.3	40 34.6 06.7	349 34.0 24.8	324 11.9 05.9	219 45.9 18.6	241 48.8 140 14 19.3 -98						
14	99 16.8	55 34.1 07.6	4 34.6 24.8	339 13.9 05.8	234 48.5 18.5	256 21.8 141 14 29.1 -98						
15	114 19.2	70 33.6 08.5	19 35.3 24.8	354 15.9 05.7	249 51.1 18.5	270 54.9 140 14 38.9 -97						
16	129 21.7	85 33.0 09.5	34 36.0 24.7	9 17.9 05.7	264 53.7 18.4	285 27.9 139 14 48.6 -96						
17	144 24.2	100 32.5 10.4	49 36.6 24.7	24 19.8 05.6	279 56.4 18.4	300 00.8 140 14 58.2 -95						
18	159 26.6	115 32.0 +15 11.3	64 37.3 +24 24.6	39 21.8 +21 05.5	294 59.0 -14 18.4	314 33.8 139 -15 07.7 -95						
19	174 29.1	130 31.5 12.2	79 38.0 24.6	54 23.8 05.4	310 01.6 18.3	329 06.7 138 15 17.2 -94						
20	189 31.6	145 31.0 13.2	94 38.7 24.5	69 25.8 05.3	325 04.2 18.3	343 39.5 139 15 26.6 -93						
21	204 34.0	160 30.4 14.1	109 39.3 24.5	84 27.8 05.2	340 06.9 18.2	358 12.4 138 15 35.9 -93						
22	219 36.5	175 29.9 15.0	124 40.0 24.4	99 29.8 05.1	355 09.5 18.2	12 45.2 138 15 45.2 -92						
23	234 38.9	190 29.4 15.9	139 40.7 24.4	114 31.8 05.0	10 12.1 18.2	27 18.0 137 15 54.4 -91						
2 ⁰	249 41.4	205 28.9 +15 16.8	154 41.4 +24 24.3	129 33.8 +21 04.9	25 14.7 -14 18.1	41 50.7 137 -16 03.5 -90						
1	264 43.9	220 28.3 17.8	169 42.0 24.3	144 35.7 04.8	40 17.4 18.1	56 23.4 137 16 12.5 -90						
2	279 46.3	235 27.8 18.7	184 42.7 24.2	159 37.7 04.8	55 20.0 18.0	70 56.1 136 16 21.5 -89						
3	294 48.8	250 27.3 19.6	199 43.4 24.2	174 39.7 04.7	70 22.6 18.0	85 28.7 136 16 30.4 -88						
4	309 51.3	265 26.8 20.5	214 44.1 24.2	189 41.7 04.6	85 25.3 18.0	100 01.3 136 16 39.2 -88						
5	324 53.7	280 26.2 21.4	229 44.7 24.1	204 43.7 04.5	100 27.9 17.9	114 33.9 135 16 48.0 -87						
6	339 56.2	295 25.7 +15 22.4	244 45.4 +24 24.1	219 45.7 +21 04.4	115 30.5 -14 17.9	129 06.4 135 -16 56.7 -86						
7	354 58.7	310 25.2 23.3	259 46.1 24.0	234 47.7 04.3	130 33.1 17.8	143 38.9 135 17 05.3 -85						
8	10 01.1	325 24.7 24.2	274 46.8 24.0	249 49.6 04.2	145 35.8 17.8	158 11.4 134 17 13.8 -84						
9	25 03.6	340 24.1 25.1	289 47.4 23.9	264 51.6 04.1	160 38.4 17.8	172 43.8 134 17 22.2 -84						
10	40 06.1	355 23.6 26.0	304 48.1 23.9	279 53.6 04.0	175 41.0 17.7	187 16.2 134 17 30.6 -83						
11	55 08.5	10 23.1 26.9	319 48.8 23.8	294 55.6 03.9	190 43.6 17.7	201 48.6 133 17 38.9 -82						
12	70 11.0	25 22.6 +15 27.8	334 49.5 +24 23.7	309 57.6 +21 03.9	205 46.3 -14 17.6	216 20.9 133 -17 47.1 -81						
13	85 13.4	40 22.0 28.7	349 50.1 23.7	324 59.6 03.8	220 48.9 17.6	230 53.2 132 17 55.2 -81						
14	100 15.9	55 21.5 29.7	4 50.8 23.6	340 01.6 03.7	235 51.5 17.6	245 25.4 132 18 03.3 -80						
15	115 18.4	70 21.0 30.6	19 51.5 23.6	355 03.5 03.6	250 54.1 17.5	259 57.6 132 18 11.3 -79						
16	130 20.8	85 20.4 31.5	34 52.2 23.5	10 05.5 03.5	265 56.8 17.5	274 29.8 131 18 19.2 -78						
17	145 23.3	100 19.9 32.4	49 52.8 23.5	25 07.5 03.4	280 59.4 17.4	289 01.9 131 18 27.0 -77						
18	160 25.8	115 19.4 +15 33.3	64 53.5 +24 23.4	40 09.5 +21 03.3	296 02.0 -14 17.4	303 34.0 131 -18 34.7 -76						
19	175 28.2	130 18.8 34.2	79 54.2 23.4	55 11.5 03.2	311 04.6 17.4	318 06.1 130 18 42.3 -76						
20	190 30.7	145 18.3 35.1	94 54.9 23.3	70 13.5 03.1	326 07.2 17.3	332 38.1 130 18 49.9 -75						
21	205 33.2	160 17.8 36.0	109 55.5 23.3	85 15.4 03.0	341 09.9 17.3	347 10.1 129 18 57.4 -74						
22	220 35.6	175 17.2 36.9	124 56.2 23.2	100 17.4 03.0	356 12.5 17.3	1 42.0 130 19 04.8 -73						
23	235 38.1	190 16.7 37.8	139 56.9 23.2	115 19.4 02.9	11 15.1 17.2	16 14.0 128 19 12.1 -72						
24	250 40.6	205 16.2 +15 38.7	154 57.6 +24 23.1	130 21.4 +21 02.8	26 17.7 -14 17.2	30 45.8 129 -19 19.3 -71						
code	-	- 5 + 9	+ 7 - 1	+ 20 - 1	+ 27 0							

G M T	SUN				STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS			
	GHA		Dec.		No.	Name	SHA	Dec.				Moonrise				Alt.	Sun's Low'r Limb Add	Venus Add	Mars Add
	h	m	°	'				N	h	m	h	m	h	m	h				
31	0	180	39.0	+21 46.3	7	Acamar	315 51.7	-40 28.8	72	□	□	16 42	18 55	■	■	Alt.			
	1	195	38.9	46.7	5	Achernar	335 59.4	-57 27.5	70	□	□	16 23	18 17	20 35	■				
	2	210	38.8	47.0	30	Acruz	173 57.8	-62 51.5	68	□	□	16 08	17 51	19 40	21 57				
	3	225	38.7	47.4	19	Adhara	255 47.0	-28 54.8	66	1 15	///	15 56	17 31	19 08	20 47	°			
	4	240	38.6	47.8	10	Aldebaran	291 39.7	+16 25.3	64	2 00	///	15 46	17 15	18 44	20 11	0	0.1	0.1	0.1
	5	255	38.5	48.1					62	2 28	///	15 38	17 02	18 25	19 46	30	0.1	0.1	0.0
	6	270	38.5	+21 48.5	32	Alioth	166 58.4	+56 12.2	60	2 50	///	15 31	16 51	18 10	19 26	45	0.1	0.1	0.0
	7	285	38.4	48.9	34	Alkaid	153 32.7	+49 32.2	58	3 08	///	15 25	16 41	17 57	19 09	60	0.1	0.0	0.0
	8	300	38.3	49.2	55	Al Na'ir	28 38.1	-47 10.4	56	3 23	///	15 19	16 33	17 45	18 55	75	0.1	0.0	0.0
	9	315	38.2	49.6	15	Alnilam	276 30.8	-1 13.8	54	3 35	///	15 14	16 25	17 36	18 43	90	0.1	0.0	0.0
	10	330	38.1	50.0	25	Alphard	218 38.9	-8 28.1	52	3 47	///	15 10	16 19	17 27	18 33				
	11	345	38.0	50.3					50	3 56	0 13	15 05	16 13	17 19	18 23	Moon's Lower Limb			
	12	0	37.9	+21 50.7	41	Alphecca	126 47.5	+26 51.8	45	4 17	1 55	14 57	16 00	17 03	18 03	Add			
	13	15	37.9	51.1	1	Alpheratz	358 28.7	+28 50.6	40	4 34	2 36	14 49	15 50	16 49	17 47	Alt.	31	1	2
	14	30	37.8	51.4	51	Altair	62 50.4	+8 44.9	35	4 47	3 04	14 43	15 41	16 38	17 34	°			
	15	45	37.7	51.8	2	Ankaa	353 58.7	-42 32.6	30	5 00	3 26	14 38	15 33	16 28	17 22	0	13.0	12.5	12.1
	16	60	37.6	52.2	42	Antares	113 19.3	-26 20.2	20	5 20	3 57	14 28	15 19	16 11	17 02	4	13.0	12.5	12.1
	17	75	37.5	52.5					10	5 38	4 21	14 20	15 08	15 56	16 45	8	13.0	12.5	12.1
	18	90	37.4	+21 52.9	37	Arcturus	146 35.1	+19 24.8	0	5 54	4 40	14 13	14 57	15 42	16 29	12	13.1	12.6	12.2
	19	105	37.3	53.2	43	Atria	108 59.7	-68 57.0	10	6 10	4 55	14 05	14 46	15 28	16 13	16	13.1	12.6	12.2
	20	120	37.2	53.6	22	Avior	234 36.3	-59 22.3	20	6 28	5 09	13 57	14 34	15 14	15 55	20	13.2	12.7	12.3
	21	135	37.1	53.9	13	Bellatrix	279 19.0	+6 18.6	30	6 47	5 22	13 48	14 21	14 57	15 36	24	13.2	12.7	12.4
	22	150	37.1	54.3	16	Betelge'se	271 48.7	+7 24.0	35	6 59	5 28	13 43	14 14	14 47	15 24	28	13.3	12.8	12.5
	23	165	37.0	54.7					40	7 12	5 35	13 37	14 05	14 36	15 11	32	13.3	12.9	12.6
1	0	180	36.9	+21 55.0	17	Canopus	264 16.0	-52 40.4	45	7 27	5 41	13 30	13 55	14 23	14 56	36	13.4	13.0	12.7
	1	195	36.8	55.4	12	Capella	281 39.2	+45 57.3	50	7 46	5 48	13 22	13 43	14 08	14 37	40	13.5	13.1	12.8
	2	210	36.7	55.7	53	Deneb	50 00.9	+45 07.1	52	7 55	5 51	13 18	13 38	14 00	14 28	44	13.6	13.2	12.9
	3	225	36.6	56.1	28	Denebola	183 17.9	+14 49.2	54	8 05	5 54	13 14	13 32	13 52	14 18	48	13.7	13.4	13.1
	4	240	36.5	56.4	4	Diphda	349 39.6	-18 13.7	56	8 17	5 57	13 10	13 25	13 43	14 07	52	13.8	13.5	13.2
	5	255	36.4	56.8					58	8 30	6 00	13 05	13 17	13 33	13 54	56	13.9	13.6	13.4
	6	270	36.3	+21 57.1	27	Dubhe	194 44.8	+61 59.7	60	8 45	6 04	12 59	13 09	13 21	13 39	60	14.1	13.8	13.5
	7	285	36.3	57.5	14	Elnath	279 08.0	+28 34.3								64	14.2	13.9	13.7
	8	300	36.2	57.8	47	Eltanin	91 05.8	+51 29.5								68	14.3	14.1	13.9
	9	315	36.1	58.2	54	Enif	34 29.7	+9 40.2								72	14.5	14.2	14.1
	10	330	36.0	58.5	56	Fomalhaut	16 11.9	-29 51.3								76	14.6	14.4	14.3
	11	345	35.9	58.9												80	14.7	14.6	14.4
	12	0	35.8	+21 59.2	31	Gacrux	172 49.3	-56 52.2	72	□	□	12 59	13 04	13 14	13 24	84	14.9	14.7	14.6
	13	15	35.7	59.6	29	Gienah	176 37.0	-17 17.9	70	□	□	0 20	0 20	0 20	0 20	88	15.0	14.9	14.8
	14	30	35.6	21 59.9	35	Hadar	149 49.3	-60 09.8	68	□	□	0 29	0 20	0 23	0 15				
	15	45	35.5	22 00.3	6	Hamal	328 50.2	+23 15.1	66	22 44	///	0 36	0 33	0 30	0 28	Add to table, back cover			
	16	60	35.4	00.6	48	Kaus Aust.	84 41.1	-34 24.4	64	21 58	///	0 43	0 44	0 47	0 52	Moon's Upper Limb			
	17	75	35.3	01.0					62	21 29	///	0 48	0 54	1 01	1 11	Subtract			
	18	90	35.2	+22 01.3	40	Kochab	137 16.8	+74 20.3	60	21 06	///	0 53	1 02	1 13	1 27	Alt.	31	1	2
	19	105	35.2	01.7	57	Markab	14 21.7	+14 57.9	58	20 48	///	0 58	1 09	1 23	1 41	°			
	20	120	35.1	02.0	8	Menkar	315 00.9	+3 55.0	56	20 34	///	1 01	1 15	1 32	1 53	0	17.0	17.3	17.5
	21	135	35.0	02.3	36	Menkent	148 58.6	-36 09.3	54	20 21	///	1 05	1 21	1 40	2 03	4	17.0	17.3	17.5
	22	150	34.9	02.7	24	Miap'dus	221 49.5	-69 32.4	52	20 09	///	1 08	1 27	1 47	2 12	8	17.0	17.3	17.5
	23	165	34.8	03.0					50	20 00	///	1 11	1 31	1 54	2 20	12	16.9	17.2	17.4
					9	Mirfak	309 43.2	+49 42.2	45	19 39	22 03	1 17	1 41	2 08	2 38	16	16.9	17.2	17.4
					50	Nunki	76 51.9	-26 21.2	40	19 22	21 21	1 23	1 50	2 19	2 52	20	16.9	17.1	17.3
					52	Peacock	54 27.3	-56 52.5	35	19 08	20 52	1 27	1 57	2 29	3 04	24	16.8	17.1	17.2
					21	Pollux	244 21.1	+28 08.1	30	18 56	20 31	1 31	2 03	2 38	3 15	28	16.7	17.0	17.2
					20	Procyon	245 45.5	+5 20.4	20	18 35	19 58	1 38	2 15	2 53	3 33	32	16.7	16.9	17.1
									10	18 18	19 35	1 44	2 24	3 06	3 49	36	16.6	16.8	16.9
					46	R'alhague	96 46.5	+12 35.4	0	18 01	19 15	1 50	2 34	3 18	4 04	40	16.5	16.7	16.8
					26	Regulus	208 29.8	+12 11.1	10	17 45	19 00	1 56	2 43	3 31	4 19	44	16.4	16.6	16.7
					11	Rigel	281 54.2	-8 15.1	20	17 28	18 46	2 02	2 53	3 44	4 35	48	16.3	16.4	16.6
					38	Rigel Kent.	140 50.7	-60 39.5	30	17 08	18 33	2 09	3 04	3 59	4 54	52	16.2	16.3	16.4
					44	Sabik	103 02.1	-15 40.3	35	16 57	18 27	2 13	3 11	4 08	5 05	56	16.1	16.2	16.2
									40	16 43	18 19	2 18	3 18	4 18	5 17	60	15.9	16.0	16.1
					3	Schedar	350 30.5	+56 17.4	45	16 28	18 13	2 24	3 27	4 30	5 32	64	15.8	15.9	15.9
					45	Shaula	97 20.6	-37 04.4	50	16 09	18 06	2 30	3 38	4 45	5 50	68	15.7	15.7	15.7
					18	Sirius	259 12.4	-16 39.3	52	16 00	18 03	2 33	3 43	4 52	5 59	72	15.6	15.6	15.6
					33	Spica	159 16.9	-10 55.9	54	15 50	18 00	2 36	3 48	4 59	6 08	76	15.4	15.4	15.4
					23	Suhail	223 24.7	-43 15.4	56	15 38	17 57	2 40	3 54	5 08	6 19	80			

G M T	T		VENUS - 3.3		MARS 1.9		JUPITER - 1.4		SATURN 0.4		MOON			
	GHA*		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'
30	250 40.6		205 16.2	+15 38.7	154 57.6	+24 23.1	130 21.4	+21 02.8	26 17.7	-14 17.2	30 45.8	129	-19 19.3	- 71
1	265 43.0		220 15.6	39.6	169 58.2	23.0	145 23.4	02.7	41 20.4	17.1	45 17.7	128	19 26.4	- 71
2	280 45.5		235 15.1	40.5	184 58.9	23.0	160 25.4	02.6	56 23.0	17.1	59 49.5	127	19 33.5	- 69
3	295 47.9		250 14.6	.. 41.4	199 59.6	.. 22.9	175 27.4	.. 02.5	71 25.6	.. 17.1	74 21.2	127	19 40.4	- 69
4	310 50.4		265 14.0	42.3	215 00.3	22.9	190 29.3	02.4	86 28.2	17.0	88 52.9	127	19 47.3	- 68
5	325 52.9		280 13.5	43.2	230 01.0	22.8	205 31.3	02.3	101 30.9	17.0	103 24.6	127	19 54.1	- 66
6	340 55.3		295 13.0	+15 44.1	245 01.6	+24 22.8	220 33.3	+21 02.2	116 33.5	-14 16.9	117 56.3	126	-20 00.7	- 66
7	355 57.8		310 12.4	45.0	260 02.3	22.7	235 35.3	02.1	131 36.1	16.9	132 27.9	126	20 07.3	- 65
8	11 00.3		325 11.9	45.9	275 03.0	22.6	250 37.3	02.0	146 38.7	16.9	146 59.5	125	20 13.8	- 65
9	26 02.7		340 11.3	.. 46.8	290 03.7	.. 22.6	265 39.2	.. 02.0	161 41.4	.. 16.8	161 31.0	125	-20 20.3	- 63
10	41 05.2		355 10.8	47.7	305 04.3	22.5	280 41.2	01.9	176 44.0	16.8	176 02.5	125	20 26.6	- 62
11	56 07.7		10 10.3	48.6	320 05.0	22.5	295 43.2	01.8	191 46.6	16.7	190 34.0	124	20 32.8	- 61
12	71 10.1		25 09.7	+15 49.5	335 05.7	+24 22.4	310 45.2	+21 01.7	206 49.2	-14 16.7	205 05.4	124	-20 38.9	- 61
13	86 12.6		40 09.2	50.4	350 06.4	22.3	325 47.2	01.6	221 51.8	16.7	219 36.8	123	20 45.0	- 59
14	101 15.0		55 08.7	51.3	5 07.0	22.3	340 49.2	01.5	236 54.5	16.6	234 08.1	124	20 50.9	- 59
15	116 17.5		70 08.1	.. 52.2	20 07.7	.. 22.2	355 51.1	.. 01.4	251 57.1	.. 16.6	248 39.5	123	-20 56.8	- 57
16	131 20.0		85 07.6	53.1	35 08.4	22.2	10 53.1	01.3	266 59.7	16.5	263 10.8	122	21 02.5	- 57
17	146 22.4		100 07.0	54.0	50 09.1	22.1	25 55.1	01.2	282 02.3	16.5	277 42.0	122	21 08.2	- 56
18	161 24.9		115 06.5	+15 54.9	65 09.8	+24 22.0	40 57.1	+21 01.1	297 05.0	-14 16.5	292 13.2	122	-21 13.8	- 54
19	176 27.4		130 05.9	55.8	80 10.4	22.0	55 59.1	01.0	312 07.6	16.4	306 44.4	121	21 19.2	- 54
20	191 29.8		145 05.4	56.7	95 11.1	21.9	71 01.1	01.0	327 10.2	16.4	321 15.5	122	21 24.6	- 53
21	206 32.3		160 04.9	.. 57.6	110 11.8	.. 21.9	86 03.0	.. 00.9	342 12.8	.. 16.4	335 46.7	120	-21 29.9	- 52
22	221 34.8		175 04.3	58.5	125 12.5	21.8	101 05.0	00.8	357 15.4	16.3	350 17.7	121	21 35.1	- 50
23	236 37.2		190 03.8	15 59.3	140 13.1	21.7	116 07.0	00.7	12 18.1	16.3	4 48.8	120	21 40.1	- 50
40	251 39.7		205 03.2	+16 00.2	155 13.8	+24 21.7	131 09.0	+21 00.6	27 20.7	-14 16.2	19 19.8	120	-21 45.1	- 49
1	266 42.2		220 02.7	01.1	170 14.5	21.6	146 11.0	00.5	42 23.3	16.2	33 50.8	119	21 50.0	- 48
2	281 44.6		235 02.1	02.0	185 15.2	21.5	161 12.9	00.4	57 25.9	16.2	48 21.7	119	21 54.8	- 47
3	296 47.1		250 01.6	.. 02.9	200 15.9	.. 21.5	176 14.9	.. 00.3	72 28.5	.. 16.1	62 52.6	119	-21 59.5	- 45
4	311 49.5		265 01.0	03.8	215 16.5	21.4	191 16.9	00.2	87 31.2	16.1	77 23.5	119	-22 04.0	- 45
5	326 52.0		280 00.5	04.7	230 17.2	21.3	206 18.9	00.1	102 33.8	16.0	91 54.4	118	-22 08.5	- 44
6	341 54.5		294 59.9	+16 05.6	245 17.9	+24 21.3	221 20.9	+21 00.0	117 36.4	-14 16.0	106 25.2	118	-22 12.9	- 42
7	356 56.9		309 59.4	06.4	260 18.6	21.2	236 22.8	20 59.9	132 39.0	16.0	120 56.0	117	-22 17.1	- 42
8	11 59.4		324 58.8	07.3	275 19.2	21.1	251 24.8	59.8	147 41.7	15.9	135 26.7	118	-22 21.3	- 41
9	27 01.9		339 58.3	.. 08.2	290 19.9	.. 21.1	266 26.8	.. 59.8	162 44.3	.. 15.9	149 57.5	117	-22 25.4	- 39
10	42 04.3		354 57.8	09.1	305 20.6	21.0	281 28.8	59.7	177 46.9	15.9	164 28.2	117	-22 29.3	- 39
11	57 06.8		9 57.2	10.0	320 21.3	20.9	296 30.7	59.6	192 49.5	15.8	178 58.9	116	-22 33.2	- 37
12	72 09.3		24 56.7	+16 10.9	335 22.0	+24 20.9	311 32.7	+20 59.5	207 52.1	-14 15.8	193 29.5	116	-22 36.9	- 37
13	87 11.7		39 56.1	11.7	350 22.6	20.8	326 34.7	59.4	222 54.8	15.7	208 00.1	116	-22 40.6	- 35
14	102 14.2		54 55.5	12.6	5 23.3	20.7	341 36.7	59.3	237 57.4	15.7	222 30.7	116	-22 44.1	- 35
15	117 16.7		69 55.0	.. 13.5	20 24.0	.. 20.7	356 38.7	.. 59.2	253 00.0	.. 15.7	237 01.3	116	-22 47.6	- 33
16	132 19.1		84 54.4	14.4	35 24.7	20.6	11 40.6	59.1	268 02.6	15.6	251 31.9	115	-22 50.9	- 32
17	147 21.6		99 53.9	15.2	50 25.4	20.5	26 42.6	59.0	283 05.2	15.6	266 02.4	115	-22 54.1	- 31
18	162 24.0		114 53.3	+16 16.1	65 26.0	+24 20.5	41 44.6	+20 58.9	298 07.9	-14 15.6	280 32.9	115	-22 57.2	- 30
19	177 26.5		129 52.8	17.0	80 26.7	20.4	56 46.6	58.8	313 10.5	15.5	295 03.4	114	-23 00.2	- 29
20	192 29.0		144 52.2	17.9	95 27.4	20.3	71 48.6	58.7	328 13.1	15.5	309 33.8	114	-23 03.1	- 28
21	207 31.4		159 51.7	.. 18.7	110 28.1	.. 20.2	86 50.5	.. 58.6	343 15.7	.. 15.4	324 04.2	114	-23 05.9	- 27
22	222 33.9		174 51.1	19.6	125 28.7	20.2	101 52.5	58.6	358 18.3	15.4	338 34.6	114	-23 08.6	- 26
23	237 36.4		189 50.6	20.5	140 29.4	20.1	116 54.5	58.5	13 21.0	15.4	353 05.0	114	-23 11.2	- 25
50	252 38.8		204 50.0	+16 21.4	155 30.1	+24 20.0	131 56.5	+20 58.4	28 23.6	-14 15.3	7 35.4	113	-23 13.7	- 23
1	267 41.3		219 49.4	22.2	170 30.8	20.0	146 58.4	58.3	43 26.2	15.3	22 05.7	114	-23 16.0	- 23
2	282 43.8		234 48.9	23.1	185 31.5	19.9	162 00.4	58.2	58 28.8	15.2	36 36.1	113	-23 18.3	- 21
3	297 46.2		249 48.3	.. 24.0	200 32.1	.. 19.8	177 02.4	.. 58.1	73 31.4	.. 15.2	51 06.4	113	-23 20.4	- 21
4	312 48.7		264 47.8	24.9	215 32.8	19.7	192 04.4	58.0	88 34.0	15.2	65 36.7	113	-23 22.5	- 19
5	327 51.2		279 47.2	25.7	230 33.5	19.7	207 06.4	57.9	103 36.7	15.1	80 07.0	112	-23 24.4	- 18
6	342 53.6		294 46.7	+16 26.6	245 34.2	+24 19.6	222 08.3	+20 57.8	118 39.3	-14 15.1	94 37.2	113	-23 26.2	- 17
7	357 56.1		309 46.1	27.5	260 34.9	19.5	237 10.3	57.7	133 41.9	15.1	109 07.5	112	-23 27.9	- 16
8	12 58.5		324 45.5	28.3	275 35.5	19.4	252 12.3	57.6	148 44.5	15.0	123 37.7	112	-23 29.5	- 15
9	28 01.0		339 45.0	.. 29.2	290 36.2	.. 19.4	267 14.3	.. 57.5	163 47.1	.. 15.0	138 07.9	112	-23 31.0	- 13
10	43 03.5		354 44.4	30.1	305 36.9	19.3	282 16.2	57.4	178 49.8	14.9	152 38.1	112	-23 32.3	- 13
11	58 05.9		9 43.9	30.9	320 37.6	19.2	297 18.2	57.3	193 52.4	14.9	167 08.3	112	-23 33.6	- 11
12	73 08.4		24 43.3	+16 31.8	335 38.3	+24 19.1	312 20.2	+20 57.2	208 55.0	-14 14.9	181 38.5	112	-23 34.7	- 11
13	88 10.9		39 42.7	32.7	350 39.0	19.1	327 22.2	57.2	223 57.6	14.8	196 08.7	111	-23 35.8	- 9
14	103 13.3		54 42.2	33.5	5 39.6	19.0	342 24.1	57.1	239 00.2	14.8	210 38.8	112	-23 36.7	- 8
15	118 15.8		69 41.6	.. 34.4	20 40.3	.. 18.9	357 26.1	.. 57.0	254 02.9	.. 14.8	225 09.0	111	-23 37.5	- 7
16	133 18.3		84 41.0	35.2	35 41.0	18.8	12 28.1	56.9	269 05.5	14.7	239 39.1	111	-23 38.2	- 6
17	148 20.7		99 40.5	36.1	50 41.7	18.8	27 30.1	56.8	284 08.1	14.7	254 09.2	112	-23 38.8	- 5
18	163 23.2		114 39.9	+16 37.0	65 42.4	+24 18.7	42 32.0	+20 56.7	299 10.7	-14 14.7	268 39.4	111	-23 39.3	- 4
19	178 25.6		129 39.3	37.8	80 43.0	18.6	57 34.0	56.6	314 13.3	14.6	283 09.5	111	-23 39.7	- 2
20	193 28.1		144 38.8	38.7	95 43.7	18.5	72 36.0	56.5	329 15.9	14.6	297 39.6	111	-23 39.9	- 2
21	208 30.6		159 38.2	.. 39.5	110 44.4	.. 18.4	87 38.0	.. 56.4	344 18.6	.. 14.5	312 09.7	111	-23 40.1	0
22	223 33.0		174 37.6	40.4	125 45.1	18.4	102 40.0	56.3	359 21.2	14.5	326 39.8	111	-23 40.1+	1
23	238 35.5		189 37.1	41.2	140 45.8	18.3	117 41.9	56.2	14 23.8	14.5	341 09.9	111	-23 40.0+	2
24	253 38.0		204 36.5	+16 42.1	155 46.4	+24 18.2	132 43.9	+20 56.1	29 26.4	-14 14.4	355 40.0	111	-23 39.8+	3
code	-		- 6	+ 8	+ 6	- 1	+ 20	- 1	+ 27	+ 1				

G M T	SUN			STARS			Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS																
	GHA	Dec.	No.	Name	SHA	Dec.				3	4	5	6	Alt.	Sun's Low'r Limb	Venus	Mars													
h	°	'	°	°	'	°	N	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	
3	0	180	32.4	+22	11.3	7	Acamar	315	51.7	-40	28.8	72	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1	195	32.4		11.6	5	Achernar	335	59.4	-57	27.5	70	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	2	210	32.2		12.0	30	Acrux	173	57.8	-62	51.5	68	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	3	225	32.1	..	12.3	19	Adhara	255	47.0	-28	54.8	66	1	02	///	20	47	22	26	23	42	23	59	0	0	0	0	0	0	
	4	240	32.0		12.6	10	Aldebaran	291	39.7	+16	25.3	64	1	52	///	20	11	21	31	22	33	23	09	0	0	0	0	0	0	
	5	255	31.9		12.9							62	2	23	///	19	46	20	58	21	57	22	37	30	0.1	0.1	0.1	0.1	0.1	
	6	270	31.8	+22	13.3	32	Alioth	166	58.4	+56	12.2	60	2	46	///	19	26	20	34	21	31	22	13	45	0.1	0.1	0.1	0.0	0.0	
	7	285	31.7		13.6	34	Alkaid	153	32.7	+49	32.2	58	3	04	///	19	09	20	15	21	11	21	55	60	0.1	0.1	0.1	0.0	0.0	
	8	300	31.6		13.9	55	Al Na'ir	28	38.1	-47	10.3	56	3	20	///	18	55	19	59	20	54	21	39	75	0.1	0.0	0.0	0.0	0.0	
	9	315	31.5	..	14.2	15	Alnilam	276	30.8	-1	13.8	54	3	33	///	18	43	19	45	20	40	21	25	90	0.1	0.0	0.0	0.0	0.0	
	10	330	31.4		14.5	25	Alphard	218	38.9	-8	28.0	52	3	44	///	18	33	19	34	20	28	21	13							
	11	345	31.3		14.8							50	3	54	///	18	23	19	23	20	17	21	03							
	12	0	31.2	+22	15.2	41	Alphecca	126	47.5	+26	51.8	45	4	15	1	18	03	19	01	19	54	20	41							
	13	15	31.1		15.5	1	Alpheratz	358	28.7	+28	50.6	40	4	32	2	33	17	47	18	43	19	35	20	23						
	14	30	31.0		15.8	51	Altair	62	50.4	+8	45.0	35	4	47	3	02	17	34	18	28	19	20	20	08						
	15	45	30.9	..	16.1	2	Ankaa	353	58.7	-42	32.6	30	4	59	3	24	17	22	18	15	19	07	19	55						
	16	60	30.8		16.4	42	Antares	113	19.3	-26	20.2	20	5	20	3	57	17	02	17	54	18	44	19	33	0	11.9	11.7	11.7	11.7	
	17	75	30.7		16.7							10	5	38	4	21	16	45	17	35	18	24	19	13	8	11.9	11.7	11.7	11.7	
	18	90	30.6	+22	17.0	37	Arcturus	146	35.1	+19	24.8	0	5	54	4	40	16	29	17	17	18	06	18	55	12	11.9	11.8	11.8	11.8	
	19	105	30.5		17.4	43	Atria	108	59.6	-68	57.0	10	6	11	4	56	16	13	16	59	17	48	18	37	16	11.9	11.8	11.8	11.8	
	20	120	30.4		17.7	22	Avior	234	36.3	-59	22.2	20	6	29	5	10	15	55	16	40	17	28	18	18	20	12.0	11.9	11.9	11.9	
	21	135	30.3	..	18.0	13	Bellatrix	279	19.0	+6	18.6	30	6	49	5	23	15	36	16	19	17	06	17	56	20	12.1	12.0	12.0	12.0	
	22	150	30.2		18.3	16	Betelge'se	271	48.7	+7	24.0	35	7	00	5	30	15	24	16	06	16	52	17	43	24	12.2	12.0	12.0	12.0	
	23	165	30.1		18.6							40	7	14	5	36	15	11	15	51	16	37	17	28	32	12.2	12.1	12.1	12.1	
						17	Canopus	264	16.0	-52	40.4	45	7	30	5	44	14	56	15	34	16	19	17	10	38	12.2	12.1	12.1	12.1	
						12	Capella	281	39.2	+45	57.3	50	7	49	5	50	14	37	15	13	15	56	16	48	36	12.4	12.2	12.2	12.2	
						53	Deneb	50	00.9	+45	07.1	52	7	58	5	53	14	28	15	03	15	45	16	37	40	12.6	12.5	12.5	12.5	
						28	Denebola	183	17.9	+14	49.2	54	8	09	5	57	14	18	14	51	15	33	16	25	44	12.7	12.6	12.6	12.6	
						4	Diphda	349	39.6	-18	13.7	56	8	20	6	00	14	07	14	38	15	19	16	11	48	12.9	12.8	12.8	12.8	
												58	8	34	6	04	13	54	14	23	15	03	15	55	52	13.1	13.0	13.0	13.0	
						27	Dubhe	194	44.8	+61	59.7	60	8	50	6	07	13	39	14	05	14	43	15	36	56	13.2	13.1	13.1	13.1	
						14	Elnath	279	08.0	+28	34.3	S													60	13.4	13.3	13.3	13.3	
						47	Eltanin	91	05.8	+51	29.5														64	13.6	13.5	13.5	13.5	
						54	Enif	34	29.7	+9	40.2														68	13.8	13.7	13.7	13.7	
						56	Fomalhaut	16	11.8	-29	51.3														72	14.0	13.9	13.9	13.9	
												N	°	h	m	h	m	h	m	h	m	h	m	h	m	76	14.2	14.1	14.1	14.1
						31	Gacrux	172	49.3	-56	52.2	72	0	0	0	0	0	0	0	0	0	0	0	0	80	14.4	14.3	14.3	14.3	
						29	Gienah	176	37.0	-17	17.9	70	0	0	0	0	0	0	0	0	0	0	0	0	84	14.6	14.5	14.5	14.5	
						35	Hadar	149	49.3	-60	09.8	68	0	0	0	0	0	0	0	0	0	0	0	0	88	14.6	14.5	14.5	14.5	
						6	Hamal	328	50.2	+23	15.1	66	22	58	///	0	28	0	26	0	28	0	54	90	14.7	14.7	14.7	14.7		
						48	Kaus Aust.	84	41.1	-34	24.4	64	22	06	///	0	52	1	02	1	23	2	04							
												62	21	35	///	1	11	1	28	1	56	2	39							
						40	Kochab	137	16.8	+74	20.4	60	21	11	///	1	27	1	49	2	20	3	05							
						57	Markab	14	21.7	+14	57.9	58	20	53	///	1	41	2	05	2	39	3	25							
						8	Menkar	315	00.8	+3	55.0	56	20	37	///	1	53	2	20	2	55	3	42							
						36	Menkent	148	58.6	-36	09.3	54	20	24	///	2	03	2	32	3	09	3	56							
						24	Miapl'dus	221	49.5	-69	32.4	52	20	13	///	2	12	2	43	3	21	4	09							
												50	20	03	///	2	20	2	53	3	32	4	20							
						9	Mirfak	309	43.2	+49	42.2	45	19	41	22	07	2	38	3	13	3	54	4	42	0	17.7	17.7	17.7	17.7	
						50	Nunki	76	51.8	-26	21.2	40	19	24	21	24	2	52	3	29	4	12	5	01	4	17.6	17.7	17.7	17.7	
						52	Peacock	54	27.2	-56	52.5	35	19	10	20	55	3	04	3	43	4	27	5	16	12	17.6	17.6	17.6	17.6	
						21	Pollux	244	21.1	+28	08.1	30	18	58	20	33	3	15	3	56	4	41	5	29	16	17.5	17.5	17.5	17.5	
						20	Procyon	245	45.5	+5	20.4	20	18	37	20	00	3	33	4	17	5	03	5	52	20	17.5	17.5	17.5	17.5	
												10	18	19	19	36	3	49	4	35	5	22	6	12	24	17.4	17.4	17.4	17.4	
						46	R'alhague	96	46.5	+12	35.4	0	18	02	19	17	4	04	4	52	5	40	6	30	28	17.3	17.3	17.3	17.3	
						26	Regulus	208	29.8	+12	11.1	10	17	45	19	00	4	19	5	09	5	59	6	48	32	17.2	17.2	17.2	17.2	
						11	Rigel	281	54.2	-8	15.1	20	17	28	18	46	4	35	5	27	6	18	7	08	36	17.0	17.1	17.1	17.1	
						38	Rigel Kent.	140	50.8	-60	39.5	30	17	08	18	33	4	54	5	48	6	40	7	30	40	16.9	17.0	17.0	17.0	
						44	Sabik	103	02.1	-15	40.3	35	16	56	18	26	5	05	6	00	6	54	7	43	44	16.8	16.8	16.8	16.8	
												40	16	42	18	19	5	17	6	14	7	09	7	59	48	16.6	16.7	16.7	16.7	
						3	Schedar	350	30.5	+56	17.4	45	16	27	18	13	5	32	6	31	7	27								

G M T	VENUS — 3.3		MARS 1.9		JUPITER — 1.4		SATURN 0.4		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
h	°	'	°	'	°	'	°	'	°	'	°	'
6 0	253 38.0	204 36.5 +16 42.1	155 46.4 +24 18.2	132 43.9 +20 56.1	29 26.4 -14 14.4	355 40.0 111 -23 39.8+ 3						
1	268 40.4	219 35.9 43.0	170 47.1 18.1	147 45.9 56.0	44 29.0 14.4	10 10.1 111 23 39.5+ 4						
2	283 42.9	234 35.4 43.8	185 47.8 18.0	162 47.8 55.9	59 31.6 14.4	24 40.2 111 23 39.1+ 5						
3	298 45.4	249 34.8 .. 44.7	200 48.5 .. 18.0	177 49.8 .. 55.8	74 34.3 .. 14.3	39 10.3 111 23 38.6+ 7						
4	313 47.8	264 34.2 45.5	215 49.2 17.9	192 51.8 55.7	89 36.9 14.3	53 40.4 111 23 37.9+ 7						
5	328 50.3	279 33.7 46.4	230 49.9 17.8	207 53.8 55.7	104 39.5 14.2	68 10.5 111 23 37.2+ 9						
6	343 52.8	294 33.1 +16 47.2	245 50.5 +24 17.7	222 55.7 +20 55.6	119 42.1 -14 14.2	82 40.6 111 -23 36.3+ 10						
7	358 55.2	309 32.5 48.1	260 51.2 17.6	237 57.7 55.5	134 44.7 14.2	97 10.7 111 23 35.3+ 10						
8	13 57.7	324 32.0 48.9	275 51.9 17.5	252 59.7 55.4	149 47.3 14.1	111 40.8 112 23 34.3+ 12						
9	29 00.1	339 31.4 .. 49.8	290 52.6 .. 17.5	268 01.7 .. 55.3	164 50.0 .. 14.1	126 11.0 111 23 33.1+ 14						
10	44 02.6	354 30.8 50.6	305 53.3 17.4	283 03.6 55.2	179 52.6 14.1	140 41.1 111 23 31.7+ 14						
11	59 05.1	9 30.2 51.5	320 53.9 17.3	298 05.6 55.1	194 55.2 14.0	155 11.2 112 23 30.3+ 15						
12	74 07.5	24 29.7 +16 52.3	335 54.6 +24 17.2	313 07.6 +20 55.0	209 57.8 -14 14.0	169 41.4 111 -23 28.8+ 17						
13	89 10.0	39 29.1 53.2	350 55.3 17.1	328 09.6 54.9	225 00.4 14.0	184 11.5 112 23 27.1+ 17						
14	104 12.5	54 28.5 54.0	5 56.0 17.0	343 11.5 54.8	240 03.0 13.9	198 41.7 111 23 25.4+ 19						
15	119 14.9	69 27.9 .. 54.9	20 56.7 .. 17.0	358 13.5 .. 54.7	255 05.6 .. 13.9	213 11.8 112 23 23.5+ 20						
16	134 17.4	84 27.4 55.7	35 57.4 16.9	13 15.5 54.6	270 08.3 13.8	227 42.0 112 23 21.5+ 21						
17	149 19.9	99 26.8 56.5	50 58.0 16.8	28 17.5 54.5	285 10.9 13.8	242 12.2 112 23 19.4+ 22						
18	164 22.3	114 26.2 +16 57.4	65 58.7 +24 16.7	43 19.4 +20 54.4	300 13.5 -14 13.8	256 42.4 112 -23 17.2+ 23						
19	179 24.8	129 25.6 58.2	80 59.4 16.6	58 21.4 54.3	315 16.1 13.7	271 12.6 112 23 14.9+ 24						
20	194 27.3	144 25.1 59.1	96 00.1 16.5	73 23.4 54.2	330 18.7 13.7	285 42.8 112 23 12.5+ 25						
21	209 29.7	159 24.5 -16 59.9	111 00.8 .. 16.4	88 25.3 .. 54.1	345 21.3 .. 13.7	300 13.0 113 23 10.0+ 27						
22	224 32.2	174 23.9 17 00.8	126 01.5 16.4	103 27.3 54.0	0 23.9 13.6	314 43.3 112 23 07.3+ 27						
23	239 34.6	189 23.3 01.6	141 02.1 16.3	118 29.3 53.9	15 26.6 13.6	329 13.5 113 23 04.6+ 29						
7 0	254 37.1	204 22.7 +17 02.4	156 02.8 +24 16.2	133 31.3 +20 53.8	30 29.2 -14 13.6	343 43.8 113 -23 01.7+ 30						
1	269 39.6	219 22.2 03.3	171 03.5 16.1	148 33.2 53.8	45 31.8 13.5	358 14.1 113 22 58.7+ 30						
2	284 42.0	234 21.6 04.1	186 04.2 16.0	163 35.2 53.7	60 34.4 13.5	12 44.4 113 22 55.7+ 32						
3	299 44.5	249 21.0 .. 04.9	201 04.9 .. 15.9	178 37.2 .. 53.6	75 37.0 .. 13.4	27 14.7 114 22 52.5+ 33						
4	314 47.0	264 20.4 05.8	216 05.6 15.8	193 39.1 53.5	90 39.6 13.4	41 45.1 114 22 49.2+ 34						
5	329 49.4	279 19.8 06.6	231 06.2 15.7	208 41.1 53.4	105 42.2 13.4	56 15.5 113 22 45.8+ 35						
6	344 51.9	294 19.3 +17 07.5	246 06.9 +24 15.6	223 43.1 +20 53.3	120 44.9 -14 13.3	70 45.8 115 -22 42.3+ 36						
7	359 54.4	309 18.7 08.3	261 07.6 15.5	238 45.1 53.2	135 47.5 13.3	85 16.3 114 22 38.7+ 38						
8	14 56.8	324 18.1 09.1	276 08.3 15.5	253 47.0 53.1	150 50.1 13.3	99 46.7 114 22 34.9+ 38						
9	29 59.3	339 17.5 .. 10.0	291 09.0 .. 15.4	268 49.0 .. 53.0	165 52.7 .. 13.2	114 17.1 115 22 31.1+ 39						
10	45 01.8	354 16.9 10.8	306 09.7 15.3	283 51.0 52.9	180 55.3 13.2	128 47.6 115 22 27.2+ 41						
11	60 04.2	9 16.3 11.6	321 10.3 15.2	298 52.9 52.8	195 57.9 13.2	143 18.1 115 22 23.1+ 41						
12	75 06.7	24 15.8 +17 12.4	336 11.0 +24 15.1	313 54.9 +20 52.7	211 00.5 -14 13.1	157 48.6 115 -22 19.0+ 43						
13	90 09.1	39 15.2 13.3	351 11.7 15.0	328 56.9 52.6	226 03.2 13.1	172 19.1 116 22 14.7+ 44						
14	105 11.6	54 14.6 14.1	6 12.4 14.9	343 58.9 52.5	241 05.8 13.1	186 49.7 116 22 10.3+ 44						
15	120 14.1	69 14.0 .. 14.9	21 13.1 .. 14.8	359 00.8 .. 52.4	256 08.4 .. 13.0	201 20.3 116 22 05.9+ 46						
16	135 16.5	84 13.4 15.8	36 13.8 14.7	14 02.8 52.3	271 11.0 13.0	215 50.9 116 22 01.3+ 47						
17	150 19.0	99 12.8 16.6	51 14.5 14.6	29 04.8 52.2	286 13.6 12.9	230 21.5 117 21 56.6+ 48						
18	165 21.5	114 12.2 +17 17.4	66 15.1 +24 14.5	44 06.7 +20 52.1	301 16.2 -14 12.9	244 52.2 117 -21 51.8+ 48						
19	180 23.9	129 11.6 18.2	81 15.8 14.4	59 08.7 52.0	316 18.8 12.9	259 22.9 117 21 47.0+ 50						
20	195 26.4	144 11.1 19.1	96 16.5 14.3	74 10.7 51.9	331 21.4 12.8	273 53.6 117 21 42.0+ 51						
21	210 28.9	159 10.5 .. 19.9	111 17.2 .. 14.2	89 12.6 .. 51.8	346 24.1 .. 12.8	288 24.3 118 21 36.9+ 52						
22	225 31.3	174 09.9 20.7	126 17.9 14.2	104 14.6 51.7	1 26.7 12.8	302 55.1 118 21 31.7+ 53						
23	240 33.8	189 09.3 21.5	141 18.6 14.1	119 16.6 51.6	16 29.3 12.7	317 25.9 118 21 26.4+ 54						
8 0	255 36.3	204 08.7 +17 22.4	156 19.2 +24 14.0	134 18.6 +20 51.6	31 31.9 -14 12.7	331 56.7 119 -21 21.0+ 55						
1	270 38.7	219 08.1 23.2	171 19.9 13.9	149 20.5 51.5	46 34.5 12.7	346 27.6 119 21 15.5+ 56						
2	285 41.2	234 07.5 24.0	186 20.6 13.8	164 22.5 51.4	61 37.1 12.6	0 58.5 119 21 09.9+ 57						
3	300 43.6	249 06.9 .. 24.8	201 21.3 .. 13.7	179 24.5 .. 51.3	76 39.7 .. 12.6	15 29.4 119 21 04.2+ 57						
4	315 46.1	264 06.3 25.6	216 22.0 13.6	194 26.4 51.2	91 42.3 12.6	30 00.3 120 20 58.5+ 59						
5	330 48.6	279 05.7 26.4	231 22.7 13.5	209 28.4 51.1	106 45.0 12.5	44 31.3 120 20 52.6+ 60						
6	345 51.0	294 05.1 +17 27.3	246 23.4 +24 13.4	224 30.4 +20 51.0	121 47.6 -14 12.5	59 02.3 120 -20 46.6+ 61						
7	0 53.5	309 04.5 28.1	261 24.0 13.3	239 32.3 50.9	136 50.2 12.5	73 33.3 121 20 40.5+ 62						
8	15 56.0	324 04.0 28.9	276 24.7 13.2	254 34.3 50.8	151 52.8 12.4	88 04.4 121 20 34.3+ 63						
9	30 58.4	339 03.4 .. 29.7	291 25.4 .. 13.1	269 36.3 .. 50.7	166 55.4 .. 12.4	102 35.5 121 20 28.0+ 63						
10	46 00.9	354 02.8 30.5	306 26.1 13.0	284 38.2 50.6	181 58.0 12.3	117 06.6 122 20 21.7+ 65						
11	61 03.4	9 02.2 31.3	321 26.8 12.9	299 40.2 50.5	197 00.6 12.3	131 37.8 122 20 15.2+ 66						
12	76 05.8	24 01.6 +17 32.1	336 27.5 +24 12.8	314 42.2 +20 50.4	212 03.2 -14 12.3	146 09.0 122 -20 08.6+ 66						
13	91 08.3	39 01.0 33.0	351 28.2 12.7	329 44.1 50.3	227 05.8 12.2	160 40.2 123 20 02.0+ 68						
14	106 10.7	54 00.4 33.8	6 28.9 12.6	344 46.1 50.2	242 08.5 12.2	175 11.5 122 19 55.2+ 68						
15	121 13.2	68 59.8 .. 34.6	21 29.5 .. 12.5	359 48.1 .. 50.1	257 11.1 .. 12.2	189 42.7 124 19 48.4+ 70						
16	136 15.7	83 59.2 35.4	36 30.2 12.4	14 50.0 50.0	272 13.7 12.1	204 14.1 123 19 41.4+ 70						
17	151 18.1	98 58.6 36.2	51 30.9 12.3	29 52.0 49.9	287 16.3 12.1	218 45.4 124 19 34.4+ 71						
18	166 20.6	113 58.0 +17 37.0	66 31.6 +24 12.2	44 54.0 +20 49.8	302 18.9 -14 12.1	233 16.8 124 -19 27.3+ 73						
19	181 23.1	128 57.4 37.8	81 32.3 12.1	59 55.9 49.7	317 21.5 12.0	247 48.2 124 19 20.0+ 73						
20	196 25.5	143 56.8 38.6	96 33.0 12.0	74 57.9 49.6	332 24.1 12.0	262 19.6 125 19 12.7+ 74						
21	211 28.0	158 56.2 .. 39.4	111 33.7 .. 11.9	89 59.9 .. 49.5	347 26.7 .. 12.0	276 51.1 125 19 05.3+ 74						
22	226 30.5	173 55.6 40.2	126 34.3 11.8	105 01.8 49.4	2 29.3 11.9	291 22.6 126 18 57.9+ 76						
23	241 32.9	188 55.0 41.0	141 35.0 11.7	120 03.8 49.3	17 31.9 11.9	305 54.2 126 18 50.3+ 77						
24	256 35.4	203 54.4 +17 41.8	156 35.7 +24 11.5	135 05.8 +20 49.2	32 34.6 -14 11.9	320 25.8 126 -18 42.6+ 77						
code	-	- 6 + 9	+ 7 - 1	+ 20 - 1	+ 27 0							

G M T	SUN		STARS		Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.	No.	Name SHA Dec.				6	7	8	9	Alt.	Sun's Low'r Limb	Venus	Mars		
0	180 25.0	+22 32.9	7	Acamar 315 51.6 -40 28.8	72	0	0	0	0	0	0	0	0	0	0	0	
1	195 24.9	33.1	5	Achernar 335 59.4 -57 27.4	70	0	0	0	0	0	0	0	0	0	0	0	
2	210 24.7	33.4	30	Acrux 173 57.8 -62 51.6	68	0	0	0	0	0	0	0	0	0	0	0	
3	225 24.6	33.7	19	Adhara 255 47.0 -28 54.8	66	0 48	///	23 59	24 00	0 56	0 28	0	0	0	0	0	
4	240 24.5	34.0	10	Aldebaran 291 39.7 +16 25.3	64	1 46	///	23 09	23 27	23 35	23 40	0	0	0	0	0	
5	255 24.4	34.2			62	2 19	///	22 37	23 02	23 17	23 27	30	0.1	0.1	0.1	0.1	
6	270 24.3	+22 34.5	32	Alioth 166 58.4 +56 12.2	60	2 42	///	22 13	22 43	23 02	23 16	45	0.1	0.1	0.0	0.0	
7	285 24.2	34.8	34	Alkaid 153 32.7 +49 32.2	58	3 01	///	21 55	22 26	22 50	23 07	60	0.1	0.0	0.0	0.0	
8	300 24.1	35.1	55	Al Na'ir 28 38.1 -47 10.3	56	3 17	///	21 39	22 13	22 38	22 59	75	0.1	0.0	0.0	0.0	
9	315 24.0	35.3	15	Alnilam 276 30.8 -1 13.8	54	3 31	///	21 25	22 01	22 29	22 51	90	0.1	0.0	0.0	0.0	
10	330 23.9	35.6	25	Alphard 218 39.0 -8 28.0	52	3 42	///	21 13	21 50	22 20	22 44						
11	345 23.8	35.9			50	3 53	///	21 03	21 41	22 12	22 38						
12	0 23.7	+22 36.1	41	Alphecca 126 47.5 +26 51.8	45	4 14	1 47	20 41	21 21	21 55	22 25	Moon's Lower Limb					
13	15 23.5	36.4	1	Alpheratz 358 28.7 +28 50.6	40	4 31	2 31	20 23	21 05	21 42	22 14	Add					
14	30 23.4	36.7	51	Altair 62 50.4 +8 45.0	35	4 46	3 01	20 08	20 51	21 30	22 05	Alt.	6	7	8		
15	45 23.3	36.9	2	Ankaa 353 58.6 -42 32.6	30	4 58	3 24	19 55	20 39	21 20	21 57	0					
16	60 23.2	37.2	42	Antares 113 19.3 -26 20.2	20	5 20	3 57	19 33	20 19	21 02	21 43	4	11.9	12.0	12.4	12.4	
17	75 23.1	37.4			10	5 38	4 21	19 13	20 01	20 47	21 30	8	11.9	12.0	12.4	12.4	
18	90 23.0	+22 37.7	37	Arcturus 146 35.1 +19 24.8	0	5 55	4 40	18 55	19 44	20 32	21 19	12	11.9	12.1	12.4	12.4	
19	105 22.9	38.0	43	Atria 108 59.6 -68 57.0	10	6 12	4 57	18 37	19 28	20 18	21 07	16	12.0	12.1	12.5	12.5	
20	120 22.8	38.2	22	Avior 234 36.3 -59 22.2	20	6 30	5 12	18 18	19 10	20 02	20 54	20	12.1	12.2	12.6	12.6	
21	135 22.7	38.5	13	Bellatrix 279 19.0 +6 18.6	30	6 50	5 25	17 56	18 49	19 44	20 40	24	12.2	12.3	12.6	12.6	
22	150 22.5	38.8	16	Betelge'se 271 48.7 +7 24.0	35	7 02	5 32	17 43	18 37	19 34	20 32	28	12.2	12.4	12.7	12.7	
23	165 22.4	39.0			40	7 16	5 38	17 28	18 23	19 22	20 22	32	12.4	12.5	12.8	12.8	
7	0 180 22.3	+22 39.3	12	Canopus 264 16.0 -52 40.4	45	7 32	5 45	17 10	18 07	19 08	20 11	36	12.5	12.6	12.9	12.9	
1	195 22.2	39.5	12	Capella 281 39.2 +45 57.3	50	7 52	5 53	16 48	17 46	18 50	19 57	44	12.6	12.7	13.0	13.0	
2	210 22.1	39.8	53	Deneb 50 00.9 +45 07.1	52	8 01	5 56	16 37	17 37	18 42	19 51	48	12.7	12.8	13.1	13.1	
3	225 22.0	40.0	28	Denebola 183 17.9 +14 49.2	54	8 12	5 59	16 25	17 26	18 33	19 44	52	12.9	13.0	13.3	13.3	
4	240 21.9	40.3	4	Diphda 349 39.6 -18 13.7	56	8 24	6 03	16 11	17 13	18 22	19 36	56	13.1	13.1	13.4	13.4	
5	255 21.8	40.6			58	8 38	6 07	15 55	16 59	18 11	19 27	60	13.2	13.3	13.5	13.5	
6	270 21.6	+22 40.8	27	Dubhe 194 44.8 +61 59.7	60	8 54	6 10	15 36	16 42	17 57	19 17	64	13.4	13.5	13.7	13.7	
7	285 21.5	41.1	14	Elnath 279 08.0 +28 34.3	S							68	13.6	13.6	13.9	13.9	
8	300 21.4	41.3	47	Eltanin 91 05.8 +51 29.5								72	13.8	13.8	14.0	14.0	
9	315 21.3	41.6	54	Enif 34 29.7 +9 40.2								76	14.0	14.0	14.2	14.2	
10	330 21.2	41.8	56	Fomalhaut 16 11.8 -29 51.3								80	14.2	14.2	14.4	14.4	
11	345 21.1	42.1	31	Gacrux 172 49.3 -56 52.2	72	0	0	0	0	0	0	84	14.4	14.4	14.5	14.5	
12	0 21.0	+22 42.3	29	Gienah 176 37.0 -17 17.9	70	0	0	0	0	0	0	88	14.6	14.6	14.7	14.7	
13	15 20.9	42.6	35	Hadar 149 49.3 -60 09.9	68	0	0	0	0	0	0	90	14.7	14.7	14.8	14.8	
14	30 20.7	42.8	6	Hamal 328 50.1 +23 15.1	66	23 14	///	0 54	2 20	4 00	5 41	Add to table, back cover					
15	45 20.6	43.1	48	Kaus Aust. 84 41.1 -34 24.4	64	22 13	///	2 04	3 10	4 33	6 03	Moon's Upper Limb					
16	60 20.5	43.3			62	21 40	///	2 39	3 41	4 57	6 20	Subtract					
17	75 20.4	43.6	40	Kochab 137 16.8 +74 20.4	60	21 16	///	3 05	4 05	5 16	6 34	Alt.	6	7	8		
18	90 20.3	+22 43.8	57	Markab 14 21.7 +14 57.9	58	20 57	///	3 25	4 24	5 32	6 47	0					
19	105 20.2	44.1	8	Menkar 315 00.8 +3 55.0	56	20 41	///	3 42	4 39	5 45	6 57	4	17.7	17.6	17.4	17.4	
20	120 20.1	44.3	36	Menkent 148 58.6 -36 09.4	54	20 27	///	3 56	4 53	5 57	7 06	8	17.6	17.5	17.3	17.3	
21	135 19.9	44.5	24	Miapl'dus 221 49.6 -69 32.4	52	20 16	///	4 09	5 04	6 07	7 15	12	17.5	17.4	17.2	17.2	
22	150 19.8	44.8			50	20 05	///	4 20	5 15	6 16	7 22	24	17.4	17.3	17.1	17.1	
23	165 19.7	45.0	9	Mirfak 309 43.2 +49 42.2	45	19 44	22 12	4 42	5 37	6 36	7 38	32	17.3	17.2	17.0	17.0	
8	0 180 19.6	+22 45.3	50	Nunki 76 51.8 -26 21.2	40	19 26	21 27	5 01	5 54	6 51	7 51	36	17.2	17.1	16.9	16.9	
1	195 19.5	45.5	52	Peacock 54 27.2 -56 52.5	35	19 12	20 58	5 16	6 09	7 04	8 02	40	16.8	16.7	16.6	16.6	
2	210 19.4	45.8	21	Pollux 244 21.1 +28 08.1	30	18 59	20 35	5 29	6 21	7 16	8 11	44	16.6	16.6	16.5	16.5	
3	225 19.2	46.0	20	Procyon 245 45.5 +5 20.4	20	18 38	20 01	5 52	6 43	7 35	8 27	48	16.5	16.4	16.3	16.3	
4	240 19.1	46.2			10	18 19	19 36	6 12	7 02	7 52	8 42	52	16.3	16.3	16.2	16.2	
5	255 19.0	46.5	46	R'halgue 96 46.5 +12 35.4	0	18 02	19 17	6 30	7 19	8 08	8 55	56	16.1	16.1	16.0	16.0	
6	270 18.9	+22 46.7	26	Regulus 208 29.8 +12 11.1	10	17 46	19 01	6 48	7 37	8 23	9 08	60	15.9	15.9	15.7	15.7	
7	285 18.8	47.0	11	Rigel 281 54.2 -8 15.1	20	17 28	18 46	7 08	7 55	8 40	9 22	64	15.8	15.7	15.7	15.7	
8	300 18.7	47.2	38	Rigel Kent. 140 50.8 -60 39.5	35	17 07	18 32	7 30	8 16	8 59	9 38	68	15.6	15.6	15.6	15.6	
9	315 18.6	47.4	44	Sabik 103 02.1 -15 40.3	40	16 42	18 19	7 59	8 43	9 23	9 57	72	15.4	15.4	15.4	15.4	
10	330 18.4	47.7	3	Schedar 350 30.5 +56 17.4	45	16 25	18 11	8 17	9 00	9 38	10 10	76	15.2	15.2	15.2	15.2	
11	345 18.3	47.9	45	Shaula 97 20.6 -37 04.4	50	16 05	18 03	8 39	9 21	9 56	10 24	80	15.0	15.0	15.0	15.0	
12	0 18.2	+22 48.1	18	Sirius 259 12.4 -16 39.3	52	15 56	18 01	8 50	9 31	10 04	10 31	84	14.8	14.8	14.9	14.9	
13	15 18.1	48.4	33	Spica 159 16.9 -10 55.9	54	15 45	17 57	9 02	9 42	10 14	10 39	88					
14	30 18.0	48.6	23	Suhail 223 24.7 -43 15.4	56	15 33	17 53	9 16	9 55	10 25	10 47	90					
15	45 17.9	48.8			58	15 20	17 50	9 32	10 10	10 37	10 57						
16	60 17.7	49.1	49	Vega 81 08.0 +38 44.4	60	15 03	17 46	9 52	10 27	10 51	11 08						
17	75 17.6	49.3	39	Zub'g'bi 137 53.3 -15 51.6	S												
18	90 17.5	+22 49.5	G M T	Equation of Time (App. Mean)		GMT of Transit Meridian of Greenwich						Subtract from table, back cover					
19	105 17.4	49.7		6	7	8	DAY	Moon	Venus	Mars	Jupiter	Saturn					
20	120 17.3	50.0		h m s	h m s	h m s	6	0 18	10 22	13 36	15 07	21 58					
21	135 17.2	50.2		6	+ 1 40.1	+ 1 29.5	7	1 07	10 23	13 35	15 04	21 54					
22	150 17.0	50.4		12	+ 1 37.5	+ 1 26.8	8	1 56	10 24	13 34	15 01	21 50					
23	165 16.9	50.7		18	+ 1 34.8	+ 1 24.1	9	2 43	10 25	13 33	14 58	21 46					
				24	+ 1 32.2	+ 1 21.4											
					+ 1 29.5	+ 1 18.6											
code	- + 3																

G M T	VENUS — 3.3		MARS 2.0		JUPITER — 1.4		SATURN 0.5		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
9 0	256 35.4	203 54.4	+17 41.8	156 35.7	+24 11.5	135 05.8	+20 49.2	32 34.6	-14 11.9	320 25.8	126	-18 42.6+ 77
1	271 37.9	218 53.8	42.6	171 36.4	11.4	150 07.7	49.1	47 37.2	11.8	334 57.4	126	18 34.9+ 79
2	286 40.3	233 53.2	43.4	186 37.1	11.3	165 09.7	49.0	62 39.8	11.8	349 29.0	127	18 27.0+ 79
3	301 42.8	248 52.6	.. 44.2	201 37.8	.. 11.2	180 11.7	.. 48.9	77 42.4	.. 11.8	4 00.7	127	-18 19.1+ 80
4	316 45.2	263 52.0	45.0	216 38.5	11.1	195 13.6	48.8	92 45.0	11.7	18 32.4	127	18 11.1+ 81
5	331 47.7	278 51.4	45.8	231 39.2	11.0	210 15.6	48.7	107 47.6	11.7	33 04.1	128	18 03.0+ 82
6	346 50.2	293 50.7	+17 46.6	246 39.9	+24 10.9	225 17.6	+20 48.6	122 50.2	-14 11.7	47 35.9	128	-17 54.8+ 83
7	1 52.6	308 50.1	47.4	261 40.5	10.8	240 19.5	48.5	137 52.8	11.6	62 07.7	128	17 46.5+ 83
8	16 55.1	323 49.5	48.2	276 41.2	10.7	255 21.5	48.4	152 55.4	11.6	76 39.5	129	17 38.2+ 85
9	31 57.6	338 48.9	.. 49.0	291 41.9	.. 10.6	270 23.5	.. 48.3	167 58.0	.. 11.6	91 11.4	129	-17 29.7+ 85
10	47 00.0	353 48.3	49.8	306 42.6	10.5	285 25.4	48.2	183 00.6	11.5	105 43.3	129	17 21.2+ 86
11	62 02.5	8 47.7	50.6	321 43.3	10.4	300 27.4	48.1	198 03.2	11.5	120 15.2	130	17 12.6+ 87
12	77 05.0	23 47.1	+17 51.4	336 44.0	+24 10.3	315 29.4	+20 48.1	213 05.9	-14 11.5	134 47.2	130	-17 03.9+ 87
13	92 07.4	38 46.5	52.2	351 44.7	10.2	330 31.3	48.0	228 08.5	11.4	149 19.2	130	16 55.2+ 89
14	107 09.9	53 45.9	53.0	6 45.4	10.1	345 33.3	47.9	243 11.1	11.4	163 51.2	130	16 46.3+ 89
15	122 12.4	68 45.3	.. 53.8	21 46.0	.. 09.9	0 35.3	.. 47.8	258 13.7	.. 11.4	178 23.2	131	-16 37.4+ 90
16	137 14.8	83 44.7	54.6	36 46.7	09.8	15 37.2	47.7	273 16.3	11.3	192 55.3	131	16 28.4+ 91
17	152 17.3	98 44.1	55.4	51 47.4	09.7	30 39.2	47.6	288 18.9	11.3	207 27.4	132	16 19.3+ 91
18	167 19.7	113 43.4	+17 56.2	66 48.1	+24 09.6	45 41.1	+20 47.5	303 21.5	-14 11.2	221 59.6	131	-16 10.2+ 92
19	182 22.2	128 42.8	57.0	81 48.8	09.5	-60 43.1	47.4	318 24.1	11.2	236 31.7	132	16 01.0+ 93
20	197 24.7	143 42.2	57.7	96 49.5	09.4	75 45.1	47.3	333 26.7	11.2	251 03.9	132	15 51.7+ 94
21	212 27.1	158 41.6	.. 58.5	111 50.2	.. 09.3	90 47.0	.. 47.2	348 29.3	.. 11.1	265 36.1	133	-15 42.3+ 95
22	227 29.6	173 41.0	17 59.3	126 50.9	09.2	105 49.0	47.1	3 31.9	11.1	280 08.4	133	15 32.8+ 95
23	242 32.1	188 40.4	18 00.1	141 51.6	09.1	120 51.0	47.0	18 34.5	11.1	294 40.7	133	15 23.3+ 96
10 0	257 34.5	203 39.8	+18 00.9	156 52.3	+24 08.9	135 52.9	+20 46.9	33 37.1	-14 11.0	309 13.0	133	-15 13.7+ 97
1	272 37.0	218 39.2	01.7	171 52.9	08.8	150 54.9	46.8	48 39.7	11.0	323 45.3	134	15 04.0+ 98
2	287 39.5	233 38.5	02.5	186 53.6	08.7	165 56.9	46.7	63 42.4	11.0	338 17.7	134	14 54.2+ 98
3	302 41.9	248 37.9	.. 03.2	201 54.3	.. 08.6	180 58.8	.. 46.6	78 45.0	.. 10.9	352 50.1	134	-14 44.4+ 99
4	317 44.4	263 37.3	04.0	216 55.0	08.5	196 00.8	46.5	93 47.6	10.9	7 22.5	134	14 34.5+ 99
5	332 46.9	278 36.7	04.8	231 55.7	08.4	211 02.7	46.4	108 50.2	10.9	21 54.9	135	14 24.6+101
6	347 49.3	293 36.1	+18 05.6	246 56.4	+24 08.3	226 04.7	+20 46.3	123 52.8	-14 10.8	36 27.4	135	-14 14.5+101
7	2 51.8	308 35.5	06.4	261 57.1	08.2	241 06.7	46.2	138 55.4	10.8	50 59.9	135	14 04.4+102
8	17 54.2	323 34.8	07.1	276 57.8	08.0	256 08.6	46.1	153 58.0	10.8	65 32.4	136	13 54.2+102
9	32 56.7	338 34.2	.. 07.9	291 58.5	.. 07.9	271 10.6	.. 46.0	169 00.6	.. 10.7	80 05.0	136	-13 44.0+103
10	47 59.2	353 33.6	08.7	306 59.2	07.8	286 12.6	45.9	184 03.2	10.7	94 37.5	137	13 33.7+104
11	63 01.6	8 33.0	09.5	321 59.8	07.7	301 14.5	45.8	199 05.8	10.7	109 10.1	136	13 23.3+104
12	78 04.1	23 32.4	+18 10.2	337 00.5	+24 07.6	316 16.5	+20 45.7	214 08.4	-14 10.6	123 42.7	136	-13 12.9+105
13	93 06.6	38 31.7	11.0	352 01.2	07.5	331 18.4	45.6	229 11.0	10.6	138 15.3	137	13 02.4+106
14	108 09.0	53 31.1	11.8	7 01.9	07.3	346 20.4	45.5	244 13.6	10.6	152 48.0	137	12 51.8+106
15	123 11.5	68 30.5	.. 12.6	22 02.6	.. 07.2	1 22.4	.. 45.4	259 16.2	.. 10.5	167 20.7	137	-12 41.2+107
16	138 14.0	83 29.9	13.3	37 03.3	07.1	16 24.3	45.3	274 18.8	10.5	181 53.4	137	12 30.5+108
17	153 16.4	98 29.2	14.1	52 04.0	07.0	31 26.3	45.2	289 21.4	10.5	196 26.1	137	12 19.7+108
18	168 18.9	113 28.6	+18 14.9	67 04.7	+24 06.9	46 28.3	+20 45.1	304 24.0	-14 10.5	210 58.8	137	-12 08.9+109
19	183 21.3	128 28.0	15.6	82 05.4	06.8	61 30.2	45.0	319 26.6	10.4	225 31.5	138	11 58.0+109
20	198 23.8	143 27.4	16.4	97 06.1	06.6	76 32.2	44.9	334 29.3	10.4	240 04.3	138	11 47.1+110
21	213 26.3	158 26.8	.. 17.2	112 06.8	.. 06.5	91 34.1	.. 44.8	349 31.9	.. 10.4	254 37.1	138	-11 36.1+111
22	228 28.7	173 26.1	18.0	127 07.4	06.4	106 36.1	44.7	4 34.5	10.3	269 09.9	138	11 25.0+111
23	243 31.2	188 25.5	18.7	142 08.1	06.3	121 38.1	44.6	19 37.1	10.3	283 42.7	138	11 13.9+112
11 0	258 33.7	203 24.9	+18 19.5	157 08.8	+24 06.2	136 40.0	+20 44.5	34 39.7	-14 10.3	298 15.5	138	-11 02.7+112
1	273 36.1	218 24.2	20.3	172 09.5	06.0	151 42.0	44.4	49 42.3	10.2	312 48.3	139	10 51.5+113
2	288 38.6	233 23.6	21.0	187 10.2	05.9	166 43.9	44.3	64 44.9	10.2	327 21.2	139	10 40.2+114
3	303 41.1	248 23.0	.. 21.8	202 10.9	.. 05.8	181 45.9	.. 44.2	79 47.5	.. 10.2	341 54.1	138	-10 28.8+114
4	318 43.5	263 22.4	22.5	217 11.6	05.7	196 47.9	44.1	94 50.1	10.1	356 26.9	139	10 17.4+114
5	333 46.0	278 21.7	23.3	232 12.3	05.5	211 49.8	44.0	109 52.7	10.1	10 59.8	139	10 06.0+115
6	348 48.5	293 21.1	+18 24.1	247 13.0	+24 05.4	226 51.8	+20 43.9	124 55.3	-14 10.1	25 32.7	139	- 9 54.5+116
7	3 50.9	308 20.5	24.8	262 13.7	05.3	241 53.7	43.8	139 57.9	10.0	40 05.6	139	9 42.9+116
8	18 53.4	323 19.9	25.6	277 14.4	05.2	256 55.7	43.7	155 00.5	10.0	54 38.5	140	9 31.3+117
9	33 55.8	338 19.2	.. 26.3	292 15.1	.. 05.1	271 57.7	.. 43.6	170 03.1	.. 10.0	69 11.5	139	9 19.6+117
10	48 58.3	353 18.6	27.1	307 15.7	04.9	286 59.6	43.5	185 05.7	09.9	83 44.4	139	9 07.9+118
11	64 00.8	8 18.0	27.9	322 16.4	04.8	302 01.6	43.4	200 08.3	09.9	98 17.3	140	8 56.1+118
12	79 03.2	23 17.3	+18 28.6	337 17.1	+24 04.7	317 03.6	+20 43.3	215 10.9	-14 09.9	112 50.3	139	- 8 44.3+118
13	94 05.7	38 16.7	29.4	352 17.8	04.6	332 05.5	43.2	230 13.5	09.8	127 23.2	140	8 32.5+120
14	109 08.2	53 16.1	30.1	7 18.5	04.4	347 07.5	43.1	245 16.1	09.8	141 56.2	139	8 20.5+119
15	124 10.6	68 15.4	.. 30.9	22 19.2	.. 04.3	2 09.4	.. 43.0	260 18.7	.. 09.8	156 29.1	140	- 8 08.6+120
16	139 13.1	83 14.8	31.6	37 19.9	04.2	17 11.4	42.9	275 21.3	09.7	171 02.1	140	7 56.6+121
17	154 15.6	98 14.2	32.4	52 20.6	04.1	32 13.3	42.8	290 23.9	09.7	185 35.1	139	7 44.5+121
18	169 18.0	113 13.5	+18 33.1	67 21.3	+24 03.9	47 15.3	+20 42.7	305 26.5	-14 09.7	200 08.0	140	- 7 32.4+121
19	184 20.5	128 12.9	33.9	82 22.0	03.8	62 17.3	42.6	320 29.1	09.6	214 41.0	140	7 20.3+122
20	199 23.0	143 12.3	34.6	97 22.7	03.7	77 19.2	42.5	335 31.7	09.6	229 14.0	139	7 08.1+122
21	214 25.4	158 11.6	.. 35.4	112 23.4	.. 03.6	92 21.2	.. 42.4	350 34.3	.. 09.6	243 46.9	140	6 55.9+123
22	229 27.9	173 11.0	36.1	127 24.1	03.4	107 23.1	42.3	5 36.9	09.5	258 19.9	139	6 43.6+123
23	244 30.3	188 10.3	36.9	142 24.8	03.3	122 25.1	42.2	20 39.5	09.5	272 52.8	140	6 31.3+124
24	259 32.8	203 09.7	+18 37.6	157 25.5	+24 03.2	137 27.1	+20 42.1	35 42.1	-14 09.5	287 25.8	139	- 6 18.9+123
code	-	- 7 -	+ 8	+ 7	- 1	+ 19	- 1	+ 26	0			

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.	No.	Name	SHA	Dec.				9	10	11	12	Alt.	Sun's Low'r Limb	Venus	Mars		
	h	m					h	m	h	m	h	m	Add					Add	Add
9	0	180 16.8	+22 50.9	7	Acamar	315 51.6	-40 28.8	72	0	0	1 11	0 36	0 36	0 36	0	0.1	0.1		
	1	195 16.7	51.1	5	Achernar	335 59.3	-57 27.4	70	0	0	1 12	0 38	0 18	0 18	30	0.1	0.1		
	2	210 16.6	51.3	30	Acruz	173 57.9	-62 51.6	68	0	0	0 28	0 14	0 14	0 14	45	0.1	0.0		
	3	225 16.4	51.6	19	Adhara	255 47.1	-28 54.7	66	0 32	///	23 55	23 52	23 49	23 46	60	0.1	0.0		
	4	240 16.3	51.8	10	Aldebaran	291 39.6	+16 25.3	64	1 40	///	23 40	23 42	23 44	23 45	75	0.1	0.0		
	5	255 16.2	52.0					62	2 15	///	23 27	23 34	23 39	23 44	90	0.1	0.0		
	6	270 16.1	+22 52.2	32	Alioth	166 58.5	+56 12.2	60	2 39	///	23 16	23 27	23 35	23 43					
	7	285 16.0	52.4	34	Alkaid	153 32.7	+49 32.2	58	2 59	///	23 07	23 20	23 32	23 42					
	8	300 15.8	52.7	55	Al Na'ir	28 38.0	-47 10.3	56	3 15	///	22 59	23 15	23 29	23 42					
	9	315 15.7	52.9	15	Alnilam	276 30.8	-1 13.8	54	3 29	///	22 51	23 10	23 26	23 41					
	10	330 15.6	53.1	25	Alphard	218 39.0	-8 28.0	52	3 41	///	22 44	23 05	23 23	23 41					
	11	345 15.5	53.3					50	3 51	///	22 38	23 01	23 21	23 40					
	12	0 15.4	+22 53.5	41	Alphecca	126 47.5	+26 51.8	45	4 13	1 43	22 25	22 52	23 16	23 39	Moon's Lower Limb				
	13	15 15.3	53.7	1	Alpheratz	358 28.6	+28 50.6	40	4 31	2 29	22 14	22 44	23 11	23 38	Add				
	14	30 15.1	54.0	51	Altair	62 50.4	+8 45.0	35	4 45	3 00	22 05	22 37	23 08	23 37	Alt.	9	10		
	15	45 15.0	54.2	2	Ankaa	353 58.6	-42 32.6	30	4 58	3 22	21 57	22 31	23 04	23 37	0	9	10		
	16	60 14.9	54.4	42	Antares	113 19.3	-26 20.2	20	5 20	3 56	21 43	22 21	22 59	23 36	0	12.8	13.4		
	17	75 14.8	54.6					10	5 38	4 21	21 30	22 12	22 53	23 34	4	12.8	13.4		
	18	90 14.7	+22 54.8	37	Arcturus	146 35.1	+19 24.8	0	5 56	4 40	21 19	22 04	22 49	23 34	8	12.8	13.4		
	19	105 14.5	55.0	43	Atria	108 59.6	-68 57.0	10	6 13	4 57	21 07	21 56	22 44	23 33	12	12.8	13.4		
	20	120 14.4	55.2	22	Avior	234 36.3	-59 22.2	20	6 31	5 12	20 54	21 47	22 39	23 32	16	12.9	13.5		
	21	135 14.3	55.5	13	Bellatrix	279 19.0	+6 18.6	30	6 52	5 26	20 40	21 36	22 33	23 30	20	12.9	13.5		
	22	150 14.2	55.7	16	Betelge'se	271 48.7	+7 24.0	35	7 04	5 33	20 32	21 30	22 30	23 30	24	13.0	13.6		
	23	165 14.1	55.9					40	7 18	5 40	20 22	21 23	22 26	23 29	28	13.0	13.6		
				17	Canopus	264 16.0	-52 40.3	45	7 34	5 47	20 11	21 16	22 21	23 28	32	13.1	13.7		
				12	Capella	281 39.2	+45 57.3	50	7 54	5 54	19 57	21 06	22 16	23 27	36	13.2	13.7		
				53	Deneb	50 00.8	+45 07.1	52	8 04	5 58	19 51	21 01	22 13	23 27	40	13.3	13.8		
				28	Denebola	183 17.9	+14 49.2	54	8 15	6 02	19 44	20 56	22 11	23 26	44	13.4	13.9		
				4	Diphda	349 39.6	-18 13.7	56	8 27	6 05	19 36	20 51	22 08	23 26	48	13.5	14.0		
								58	8 41	6 09	19 27	20 45	22 04	23 25	52	13.7	14.1		
				27	Dubhe	194 44.9	+61 59.7	60	8 58	6 13	19 17	20 38	22 01	23 24	56	13.8	14.2		
				14	Elnath	279 08.0	+28 34.3	S							60	13.9	14.3		
				47	Eltanin	91 05.8	+51 29.6		Lat.	Sunset	Twlt. ends	Moonset				64	14.1	14.4	
				54	Enif	34 29.7	+9 40.2	N.	h	m	h	m	h	m	h	m	68	14.2	14.5
				56	Fomalhaut	16 11.8	-29 51.3		h	m	h	m	h	m	h	m	72	14.3	14.6
				31	Gacrux	172 49.3	-56 52.2	72	0	0	4 28	6 07	8 17	10 15	76	14.5	14.7		
				29	Gienah	176 37.0	-17 17.9	70	0	0	5 12	7 01	8 45	10 22	80	14.6	14.9		
				35	Hadar	149 49.3	-60 09.9	68	0	0	5 41	7 19	8 55	10 31	84	14.8	15.0		
				6	Hamal	328 50.1	+23 15.1	66	23 33	///	5 41	7 19	8 55	10 31	88	14.9	15.1		
				48	Kaus Aust.	84 41.1	-34 24.4	64	22 20	///	6 03	7 33	9 04	10 35	90	15.1	15.2		
								62	21 45	///	6 20	7 45	9 11	10 38	Add to table, back cover				
				40	Kochab	137 16.9	+74 20.4	60	21 20	///	6 34	7 55	9 17	10 40	Moon's Upper Limb				
				57	Markab	14 21.6	+14 57.9	58	21 00	///	6 47	8 04	9 23	10 43	Subtract				
				8	Menkar	315 00.8	+3 55.0	56	20 44	///	6 57	8 11	9 28	10 45	Alt.	9	10		
				36	Menkent	148 58.6	-36 09.4	54	20 30	///	7 06	8 18	9 32	10 47	0	17.2	16.8		
				24	Miapl'dus	221 49.6	-69 32.4	52	20 18	///	7 15	8 24	9 36	10 48	4	17.1	16.8		
								50	20 08	///	7 22	8 30	9 39	10 50	8	17.1	16.8		
				9	Mirfak	309 43.1	+49 42.2	45	19 46	22 16	7 38	8 42	9 47	10 53	12	17.1	16.7		
				50	Nunki	76 51.8	-26 21.2	40	19 28	21 30	7 51	8 51	9 53	10 56	16	17.0	16.7		
				52	Peacock	54 27.2	-56 52.5	35	19 13	20 59	8 02	9 00	9 59	10 58	20	17.0	16.7		
				21	Pollux	244 21.1	+28 08.1	30	19 00	20 36	8 11	9 07	10 03	11 00	24	17.0	16.7		
				20	Procyon	245 45.5	+5 20.4	20	18 39	20 03	8 27	9 19	10 12	11 04	28	16.9	16.6		
								10	18 20	19 37	8 42	9 30	10 19	11 07	32	16.9	16.6		
				46	R'alhague	96 46.5	+12 35.4	0	18 03	19 18	8 55	9 40	10 25	11 10	36	16.8	16.5		
				26	Regulus	208 29.8	+12 11.1	10	17 46	19 01	9 08	9 51	10 32	11 13	40	16.7	16.4		
				11	Rigel	281 54.2	-8 15.1	20	17 28	18 46	9 22	10 01	10 39	11 16	44	16.6	16.3		
				38	Rigel Kent.	140 50.8	-60 39.5	30	17 07	18 32	9 38	10 13	10 47	11 19	48	16.6	16.3		
				44	Sabik	103 02.1	-15 40.3	35	16 55	18 25	9 47	10 20	10 51	11 21	52	16.5	16.4		
								40	16 41	18 18	9 57	10 28	10 57	11 23	56	16.4	16.3		
				3	Schedar	350 30.4	+56 17.4	45	16 25	18 11	10 10	10 37	11 03	11 26	60	16.3	16.0		
				45	Shaula	97 20.5	-37 04.5	50	16 04	18 03	10 24	10 48	11 10	11 29	64	16.2	15.9		
				18	Sirius	259 12.4	-16 39.3	52	15 55	18 00	10 31	10 53	11 13	11 30	68	16.1	15.8		
				33	Spica	159 16.9	-10 55.9	54	15 44	17 56	10 39	10 59	11 16	11 32	72	16.0	15.7		
				23	Suhail	223 24.7	-43 15.4	56	15 32	17 53	10 47	11 05	11 20	11 33	76	15.8	15.6		
								58	15 17	17 48	10 57	11 12	11 25	11 35	80	15.7	15.5		
				49	Vega	81 08.0	+38 44.4	60	15 01	17 45	11 08	11 20	11 29	11 37	84	15.6	15.6		
				39	Zub'g'bi	137 53.3	-15 51.6	S							88	15.4	15.5		
									Equation of Time (App.—Mean)				GMT of Transit Meridian of Greenwich				90	15.3	15.3
									9	10	11	DAY	Moon	Venus	Mars	Jupiter	Saturn		
									h	m	s	h	m	s	h	m	s		
				0	+ 1 07.4	+ 0 56.0	+ 0 44.2	9	2 43	10 25	13 33	14 58	21 46	Subtract from table, back cover					
				6	+ 1 04.6	+ 0 53.1	+ 0 41.2	10	3 30	10 26	13 32	14 55	21 42	Corpus Christi					
				12	+ 1 01.7	+ 0 50.1	+ 0 38.3	10	3 30	10 26	13 3								

G M T	T		VENUS — 3.3		MARS 2.0		JUPITER — 1.4		SATURN 0.5		MOON			
	GHA		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'
12 0	259 32.8		203 09.7	+18 37.6	157 25.5	+24 03.2	137 27.1	+20 42.1	35 42.1	-14 09.5	287 25.8	139 -	6 18.9	+123
1	274 35.3		218 09.1		172 26.2	03.0	152 29.0	42.0	50 44.7	09.5	301 58.7	140	6 06.6	+125
2	289 37.7		233 08.4		187 26.8	02.9	167 31.0	41.9	65 47.3	09.4	316 31.7	139	5 54.1	+124
3	304 40.2		248 07.8	.. 39.9	202 27.5	.. 02.8	182 32.9	.. 41.8	80 49.9	.. 09.4	331 04.6	139 -	5 41.7	+125
4	319 42.7		263 07.2		217 28.2	02.7	197 34.9	41.7	95 52.5	09.4	345 37.5	139	5 29.2	+126
5	334 45.1		278 06.5		232 28.9	02.5	212 36.9	41.6	110 55.1	09.3	0 10.4	139	5 16.6	+126
6	349 47.6		293 05.9	+18 42.1	247 29.6	+24 02.4	227 38.8	+20 41.5	125 57.7	-14 09.3	14 43.3	139 -	5 04.0	+126
7	4 50.1		308 05.2		262 30.3	02.3	242 40.8	41.4	141 00.3	09.3	29 16.2	139	4 51.4	+126
8	19 52.5		323 04.6		277 31.0	02.1	257 42.7	41.3	156 02.9	09.2	43 49.1	139	4 38.8	+127
9	34 55.0		338 03.9	.. 44.3	292 31.7	.. 02.0	272 44.7	.. 41.2	171 05.5	.. 09.2	58 22.0	138 -	4 26.1	+127
10	49 57.4		353 03.3		307 32.4	01.9	287 46.6	41.1	186 08.1	09.2	72 54.8	139	4 13.4	+128
11	64 59.9		8 02.7		322 33.1	01.7	302 48.6	41.0	201 10.7	09.1	87 27.7	138	4 00.6	+128
12	80 02.4		23 02.0	+18 46.5	337 33.8	+24 01.6	317 50.6	+20 40.9	216 13.3	-14 09.1	102 00.5	138 -	3 47.8	+128
13	95 04.8		38 01.4		352 34.5	01.5	332 52.5	40.8	231 15.9	09.1	116 33.3	138	3 35.0	+128
14	110 07.3		53 00.7		7 35.2	01.3	347 54.5	40.7	246 18.5	09.0	131 06.1	138	3 22.2	+129
15	125 09.8		68 00.1	.. 48.7	22 35.9	.. 01.2	2 56.4	.. 40.6	261 21.1	.. 09.0	145 38.9	137 -	3 09.3	+129
16	140 12.2		82 59.4		37 36.6	01.1	17 58.4	40.5	276 23.7	09.0	160 11.6	137	2 56.4	+129
17	155 14.7		97 58.8		52 37.3	00.9	33 00.3	40.4	291 26.3	08.9	174 44.3	138	2 43.5	+129
18	170 17.2		112 58.1	+18 50.9	67 38.0	+24 00.8	48 02.3	+20 40.3	306 28.9	-14 08.9	189 17.1	136 -	2 30.6	+130
19	185 19.6		127 57.5		82 38.7	00.7	63 04.2	40.2	321 31.5	08.9	203 49.7	137	2 17.6	+130
20	200 22.1		142 56.9		97 39.4	00.5	78 06.2	40.1	336 34.1	08.9	218 22.4	136	2 04.6	+130
21	215 24.6		157 56.2	.. 53.1	112 40.1	.. 00.4	93 08.2	.. 40.0	351 36.7	.. 08.8	232 55.0	137 -	1 51.6	+131
22	230 27.0		172 55.6		127 40.7	00.3	108 10.1	39.9	6 39.3	08.8	247 27.7	135	1 38.5	+130
23	245 29.5		187 54.9		142 41.4	00.1	123 12.1	39.8	21 41.9	08.8	262 00.2	136	1 25.5	+131
13 0	260 31.9		202 54.3	+18 55.3	157 42.1	+24 00.0	138 14.0	+20 39.7	36 44.5	-14 08.7	276 32.8	135 -	1 12.4	+131
1	275 34.4		217 53.6		172 42.8	23 59.9	153 16.0	39.6	51 47.1	08.7	291 05.3	135	0 59.3	+132
2	290 36.9		232 53.0		187 43.5	59.7	168 17.9	39.4	66 49.7	08.7	305 37.8	135	0 46.1	+131
3	305 39.3		247 52.3	.. 57.5	202 44.2	.. 59.6	183 19.9	.. 39.3	81 52.3	.. 08.6	320 10.3	134 -	0 33.0	+132
4	320 41.8		262 51.7		217 44.9	59.5	198 21.9	39.2	96 54.9	08.6	334 42.7	134	0 19.8	+132
5	335 44.3		277 51.0		232 45.6	59.3	213 23.8	39.1	111 57.5	08.6	349 15.1	134 -	0 06.6	+132
6	350 46.7		292 50.4	+18 59.6	247 46.3	+23 59.2	228 25.8	+20 39.0	127 00.1	-14 08.5	3 47.5	133 +	0 06.6	+132
7	5 49.2		307 49.7	19 00.3	262 47.0	59.0	243 27.7	38.9	142 02.7	08.5	18 19.8	133	0 19.8	+132
8	20 51.7		322 49.0		277 47.7	58.9	258 29.7	38.8	157 05.3	08.5	32 52.1	133	0 33.0	+132
9	35 54.1		337 48.4	.. 01.8	292 48.4	.. 58.8	273 31.6	.. 38.7	172 07.9	.. 08.5	47 24.4	132 -	0 46.2	+133
10	50 56.6		352 47.7		307 49.1	58.6	288 33.6	38.6	187 10.5	08.4	61 56.6	131	0 59.5	+133
11	65 59.1		7 47.1		322 49.8	58.5	303 35.5	38.5	202 13.1	08.4	76 28.7	132	1 12.8	+132
12	81 01.5		22 46.4	+19 03.9	337 50.5	+23 58.3	318 37.5	+20 38.4	217 15.7	-14 08.4	91 00.9	131 +	1 26.0	+133
13	96 04.0		37 45.8		352 51.2	58.2	333 39.4	38.3	232 18.3	08.3	105 33.0	130	1 39.3	+133
14	111 06.4		52 45.1		7 51.9	58.1	348 41.4	38.2	247 20.9	08.3	120 05.0	130	1 52.6	+133
15	126 08.9		67 44.5	.. 06.1	22 52.6	.. 57.9	3 43.4	.. 38.1	262 23.5	.. 08.3	134 37.0	130 -	2 05.9	+133
16	141 11.4		82 43.8		37 53.3	57.8	18 45.3	38.0	277 26.1	08.2	149 09.0	129	2 19.2	+133
17	156 13.8		97 43.1		52 54.0	57.6	33 47.3	37.9	292 28.7	08.2	163 40.9	129	2 32.5	+133
18	171 16.3		112 42.5	+19 08.2	67 54.7	+23 57.5	48 49.2	+20 37.8	307 31.3	-14 08.2	178 12.8	128 +	2 45.8	+133
19	186 18.8		127 41.8		82 55.4	57.4	63 51.2	37.7	322 33.9	08.2	192 44.6	127	2 59.1	+134
20	201 21.2		142 41.2		97 56.1	57.2	78 53.1	37.6	337 36.5	08.1	207 16.3	128	3 12.5	+133
21	216 23.7		157 40.5	.. 10.3	112 56.8	.. 57.1	93 55.1	.. 37.5	352 39.1	.. 08.1	221 48.1	126 -	3 25.8	+133
22	231 26.2		172 39.8		111 127 57.5	56.9	108 57.0	37.4	7 41.7	08.1	236 19.7	126	3 39.1	+133
23	246 28.6		187 39.2		142 58.2	56.8	123 59.0	37.3	22 44.3	08.0	250 51.3	126	3 52.4	+133
14 0	261 31.1		202 38.5	+19 12.5	157 58.9	+23 56.6	139 00.9	+20 37.2	37 46.9	-14 08.0	265 22.9	125 +	4 05.7	+133
1	276 33.5		217 37.9		172 59.6	56.5	154 02.9	37.1	52 49.5	08.0	279 54.4	124	4 19.0	+133
2	291 36.0		232 37.2		188 00.3	56.4	169 04.8	37.0	67 52.1	07.9	294 25.8	124	4 32.3	+134
3	306 38.5		247 36.5	.. 14.6	203 01.0	.. 56.2	184 06.8	.. 36.9	82 54.6	.. 07.9	308 57.2	123 -	4 45.7	+133
4	321 40.9		262 35.9		218 01.7	56.1	199 08.8	36.8	97 57.2	07.9	323 28.5	123	4 59.0	+132
5	336 43.4		277 35.2		233 02.4	55.9	214 10.7	36.7	112 59.8	07.9	337 59.8	122	5 12.2	+133
6	351 45.9		292 34.6	+19 16.7	248 03.1	+23 55.8	229 12.7	+20 36.6	128 02.4	-14 07.8	352 31.0	121 +	5 25.5	+133
7	6 48.3		307 33.9		263 03.8	55.6	244 14.6	36.5	143 05.0	07.8	7 02.1	121	5 38.8	+132
8	21 50.8		322 33.2		278 04.5	55.5	259 16.6	36.4	158 07.6	07.8	21 33.2	120	5 52.0	+133
9	36 53.3		337 32.6	.. 18.8	293 05.2	.. 55.3	274 18.5	.. 36.3	173 10.2	.. 07.7	36 04.2	120 -	6 05.3	+132
10	51 55.7		352 31.9		308 05.9	55.2	289 20.5	36.2	188 12.8	07.7	50 35.2	118	6 18.5	+132
11	66 58.2		7 31.2		323 06.6	55.0	304 22.4	36.1	203 15.4	07.7	65 06.0	118	6 31.7	+132
12	82 00.7		22 30.6	+19 20.9	338 07.3	+23 54.9	319 24.4	+20 36.0	218 18.0	-14 07.7	79 36.8	118 +	6 44.9	+132
13	97 03.1		37 29.9		353 08.0	54.7	334 26.3	35.8	233 20.6	07.6	94 07.6	117	6 58.1	+132
14	112 05.6		52 29.2		8 08.7	54.6	349 28.3	35.7	248 23.2	07.6	108 38.3	116	7 11.3	+131
15	127 08.0		67 28.6	.. 23.0	23 09.4	.. 54.4	4 30.2	.. 35.6	263 25.8	.. 07.6	123 08.9	115 -	7 24.4	+132
16	142 10.5		82 27.9		38 10.1	54.3	19 32.2	35.5	278 28.4	07.5	137 39.4	114	7 37.6	+131
17	157 13.0		97 27.2		53 10.8	54.1	34 34.1	35.4	293 31.0	07.5	152 09.8	114	7 50.7	+131
18	172 15.4		112 26.6	+19 25.0	68 11.5	+23 54.0	49 36.1	+20 35.3	308 33.6	-14 07.5	166 40.2	113 +	8 03.8	+130
19	187 17.9		127 25.9		83 12.2	53.8	64 38.0	35.2	323 36.2</					

G M T	SUN			STARS			Lat.	Sunrise	Twilt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.		No.	Name	SHA				Dec.	12	13	14	15	Sun's Low r Add	Venus Add	Mars Add		
h	°	'	"				N	h	m	h	m	h	m	h	m	Alt.			
12	0	180	08.0	+23	05.3	7 Acamar	315 51.6	-40 28.7	72	□	□	23 30	23 07	22 34	23 01	Alt.			
1	1	195	07.9	05.5	5 Achernar	335 59.3	-57 27.4	70	□	□	23 35	23 20	23 01	23 01	0				
2	2	210	07.7	05.6	30 Acrux	173 57.9	-62 51.6	68	□	□	23 47	23 39	23 31	23 21	0				
3	3	225	07.6	05.8	19 Adhara	255 47.1	-28 54.7	66	0 06	///	23 46	23 43	23 40	23 38	0				
4	4	240	07.5	06.0	10 Aldebaran	291 39.6	+16 25.3	64	1 36	///	23 45	23 46	23 48	23 51	0				
5	5	255	07.4	06.1				62	2 12	///	23 44	23 49	23 54	24 02	30	0.1	0.1	0.1	
6	6	270	07.2	+23	06.3	32 Alioth	166 58.5	+56 12.2	60	2 37	///	23 43	23 51	24 00	0 00	45	0.1	0.1	0.0
7	7	285	07.1	06.5	34 Alkaid	153 32.7	+49 32.2	58	2 57	///	23 42	23 53	24 05	0 05	60	0.1	0.1	0.0	
8	8	300	07.0	06.7	55 Al Na'ir	28 38.0	-47 10.3	56	3 14	///	23 42	23 55	24 10	0 10	75	0.1	0.0	0.0	
9	9	315	06.9	06.8	15 Alnilam	276 30.8	-1 13.8	54	3 28	///	23 41	23 57	24 14	0 14	90	0.1	0.0	0.0	
10	10	330	06.7	07.0	25 Alphard	218 39.0	-8 28.0	52	3 40	///	23 41	23 58	24 18	0 18					
11	11	345	06.6	07.2				50	3 50	///	23 40	24 00	0 00	0 21					
12	12	0	06.5	+23	07.3	41 Alphecca	126 47.5	+26 51.8	45	4 13	1 42	23 39	24 03	0 03	0 29	Moon's Lower Limb Add			
13	13	15	06.4	07.5	1 Alpheratz	358 28.6	+28 50.6	40	4 30	2 29	23 38	24 06	0 06	0 35	Alt.	12	13	14	
14	14	30	06.2	07.7	51 Altair	62 50.3	+8 45.0	35	4 45	2 59	23 37	24 08	0 08	0 40	0				
15	15	45	06.1	07.8	2 Ankaa	353 58.6	-42 32.5	30	4 58	3 22	23 37	24 10	0 10	0 45	0				
16	16	60	06.0	08.0	42 Antares	113 19.3	-26 20.2	20	5 20	3 56	23 36	24 13	0 13	0 54	0				
17	17	75	05.8	08.1				10	5 39	4 22	23 34	24 17	0 17	1 01	4	15.0	16.1	17.1	
18	18	90	05.7	+23	08.3	37 Arcturus	146 35.1	+19 24.8	0	5 56	4 41	23 34	24 20	0 20	1 08	8	15.0	16.1	17.1
19	19	105	05.6	08.5	43 Atria	108 59.6	-68 57.0	10	6 13	4 58	23 33	24 23	0 23	1 15	12	15.1	16.0	17.0	
20	20	120	05.5	08.6	22 Avior	234 36.4	-59 22.2	20	6 32	5 13	23 32	24 26	0 26	1 23	16	15.1	16.0	17.0	
21	21	135	05.3	08.8	13 Bellatrix	279 19.0	+6 18.6	30	6 53	5 27	23 30	24 30	0 30	1 32	20	15.1	16.0	17.0	
22	22	150	05.2	09.0	16 Betelg'se	271 48.7	+7 24.0	35	7 05	5 34	23 30	24 32	0 32	1 37	24	15.1	16.0	17.0	
23	23	165	05.1	09.1				40	7 19	5 41	23 29	24 34	0 34	1 43	28	15.1	16.0	16.9	
					17 Canopus	264 16.0	-52 40.3	45	7 36	5 48	23 28	24 37	0 37	1 49	32	15.1	16.0	16.9	
13	0	180	04.9	+23	09.3	12 Capella	281 39.2	+45 57.3	50	7 56	5 56	23 27	24 41	0 41	1 58	36	15.1	16.0	16.8
1	1	195	04.8	09.4	53 Deneb	50 00.8	+45 07.1	52	8 06	6 00	23 27	24 43	0 43	2 01	40	15.1	16.0	16.8	
2	2	210	04.7	09.6	28 Denebola	183 17.9	+14 49.2	54	8 17	6 03	23 26	24 44	0 44	2 06	44	15.2	15.9	16.7	
3	3	225	04.6	09.7	4 Diphda	349 39.6	-18 13.7	56	8 29	6 07	23 26	24 46	0 46	2 10	48	15.2	15.9	16.6	
4	4	240	04.4	09.9				58	8 44	6 11	23 25	24 49	0 49	2 16	52	15.2	15.9	16.6	
5	5	255	04.3	10.0	27 Dubhe	194 44.9	+61 59.7	60	9 01	6 15	23 24	24 51	0 51	2 21	56	15.2	15.9	16.5	
6	6	270	04.2	+23	10.2	14 El Nath	279 08.0	+28 34.3							64	15.3	15.8	16.4	
7	7	285	04.0	10.4	47 Eitanin	91 05.8	+51 29.6								68	15.3	15.8	16.3	
8	8	300	03.9	10.5	54 Enif	34 29.6	+9 40.2								72	15.3	15.8	16.2	
9	9	315	03.8	10.7	56 Fomalhaut	16 11.8	-29 51.3								76	15.4	15.7	16.1	
10	10	330	03.7	10.8											80	15.4	15.7	16.0	
11	11	345	03.5	11.0	31 Gacrux	172 49.3	-56 52.2								84	15.4	15.7	16.0	
12	12	0	03.4	+23	11.1	29 Gienah	176 37.0	-17 17.9							88	15.4	15.7	16.0	
13	13	15	03.3	11.3	35 Hadar	149 49.3	-60 09.9								90	15.4	15.7	15.9	
14	14	30	03.1	11.4	6 Hamal	328 50.1	+23 15.1												
15	15	45	03.0	11.6	48 Kaus Aust.	84 41.0	+34 24.4												
16	16	60	02.9	11.7															
17	17	75	02.8	11.8	40 Kochab	137 16.9	+74 20.4												
18	18	90	02.6	+23	12.0	57 Markab	14 21.6	+14 57.9											
19	19	105	02.5	12.1	8 Menkar	315 00.8	+3 55.0												
20	20	120	02.4	12.3	36 Menkent	148 58.7	-36 09.4												
21	21	135	02.2	12.4	24 Miapl'dus	221 49.6	-69 32.4												
22	22	150	02.1	12.6															
23	23	165	02.0	12.7	9 Mirfak	309 43.1	+49 42.2												
					50 Nunki	76 51.8	-26 21.2												
14	0	180	01.8	+23	12.8	52 Peacock	54 27.1	-56 52.5											
1	1	195	01.7	13.0	21 Pollux	244 21.1	+28 08.1												
2	2	210	01.6	13.1	20 Procyon	245 45.5	+5 20.4												
3	3	225	01.5	13.3															
4	4	240	01.3	13.4	46 R'alhague	96 46.5	+12 35.4												
5	5	255	01.2	13.5	26 Regulus	208 29.8	+12 11.1												
6	6	270	01.1	+23	13.7	11 Rigel	281 54.2	-8 15.1											
7	7	285	00.9	13.8	38 Rigil Kent	140 50.8	-60 39.5												
8	8	300	00.8	13.9	44 Sabik	103 02.1	-15 40.3												
9	9	315	00.7	14.1															
10	10	330	00.5	14.2	3 Schedar	350 30.4	+56 17.4												
11	11	345	00.4	14.4	45 Shaula	97 20.5	-37 04.3												
12	12	0	00.3	+23	14.5	18 Sirius	259 12.4	-16 39.3											
13	13	15	00.1	14.6	33 Spica	159 16.9	-10 55.9												
14	14	30	00.0	14.7	23 Suhail	223 24.8	-43 15.4												
15	15	44	59.9	14.9															
16	16	59	58.8	15.0	49 Vega	81 08.0	+38 44.4												
17	17	74	59.6	15.1	39 Zub'g'bi	137 53.3	-15 51.6												
18	18	89	59.5	+23	15.3														
19	19	104	59.4	15.4															
20	20	119	59.2	15.5															
21	21	134	59.1	15.6															
22	22	149	59.0	15.8															
23	23	164	58.8	15.9															
24	24	179	58.7	+23	16.0														
																</			

G M T	T		VENUS — 3.3			MARS 2.0			JUPITER — 1.4			SATURN 0.5			MOON			
	GHA		GHA	Dec.		GHA	Dec.		GHA	Dec.		GHA	Dec.		GHA	code	Dec.	code
15	h	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
	°	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'	'
	0	262 30.2	202 22.5	+19	29.2	158 15.7	+23	53.1	139 47.8	+20	34.7	38 49.1	-14	07.3	253 40.8	109	+ 9	21.7 +128
	1	277 32.7	217 21.8		29.8	173 16.4		52.9	154 49.7		34.6	53 51.7		07.3	268 10.7	107	9	34.5 +129
	2	292 35.1	232 21.2		30.5	188 17.1		52.8	169 51.7		34.5	68 54.3		07.2	282 40.4	107	9	47.4 +128
	3	307 37.6	247 20.5	..	31.2	203 17.8	..	52.6	184 53.6	..	34.4	83 56.9	..	07.2	297 10.1	105	-10	00.2 +128
	4	322 40.1	262 19.8		31.9	218 18.5		52.5	199 55.6		34.3	98 59.5		07.2	311 39.6	105	10	13.0 +127
	5	337 42.5	277 19.2		32.6	233 19.2		52.3	214 57.5		34.2	114 02.1		07.2	326 09.1	104	10	25.7 +127
	6	352 45.0	292 18.5	+19	33.2	248 19.9	+23	52.2	229 59.5	+20	34.1	129 04.7	-14	07.1	340 38.5	103	+10	38.4 +126
	7	7 47.5	307 17.8		33.9	263 20.6		52.0	245 01.4		34.0	144 07.3		07.1	355 07.8	102	10	51.0 +126
	8	22 49.9	322 17.1		34.6	278 21.3		51.9	260 03.4		33.9	159 09.9		07.1	9 37.0	102	11	03.6 +126
	9	37 52.4	337 16.4	..	35.3	293 22.0	..	51.7	275 05.3	..	33.8	174 12.4	..	07.0	24 06.2	100	-11	16.2 +125
	10	52 54.9	352 15.8		36.0	308 22.7		51.6	290 07.3		33.7	189 15.0		07.0	38 35.2	100	11	28.7 +125
	11	67 57.3	7 15.1		36.6	323 23.4		51.4	305 09.2		33.6	204 17.6		07.0	53 04.2	98	11	41.2 +124
	12	82 59.8	22 14.4	+19	37.3	338 24.1	+23	51.2	320 11.2	+20	33.5	219 20.2	-14	07.0	67 33.0	98	+11	53.6 +124
	13	98 02.3	37 13.7		38.0	353 24.8		51.1	335 13.1		33.3	234 22.8		06.9	82 01.8	97	12	06.0 +123
	14	113 04.7	52 13.1		38.7	8 25.5		50.9	350 15.1		33.2	249 25.4		06.9	96 30.5	95	12	18.3 +122
	15	128 07.2	67 12.4	..	39.3	23 26.2	..	50.8	5 17.0	..	33.1	264 28.0	..	06.9	110 59.0	95	-12	30.5 +123
	16	143 09.6	82 11.7		40.0	38 26.9		50.6	20 19.0		33.0	279 30.6		06.8	125 27.5	94	12	42.8 +121
	17	158 12.1	97 11.0		40.7	53 27.6		50.5	35 20.9		32.9	294 33.2		06.8	139 55.9	93	12	54.9 +121
	18	173 14.6	112 10.3	+19	41.3	68 28.3	+23	50.3	50 22.9	+20	32.8	309 35.8	-14	06.8	154 24.2	91	+13	07.0 +120
	19	188 17.0	127 09.7		42.0	83 29.0		50.1	65 24.8		32.7	324 38.4		06.8	168 52.3	91	13	19.0 +120
	20	203 19.5	142 09.0		42.7	98 29.7		50.0	80 26.8		32.6	339 40.9		06.7	183 20.4	90	13	31.0 +119
	21	218 22.0	157 08.3	..	43.3	113 30.4	..	49.8	95 28.7	..	32.5	354 43.5	..	06.7	197 48.4	89	-13	42.9 +118
22	233 24.4	172 07.6		44.0	128 31.1		49.7	110 30.7		32.4	9 46.1		06.7	212 16.3	88	13	54.7 +118	
23	248 26.9	187 06.9		44.7	143 31.8		49.5	125 32.6		32.3	24 48.7		06.7	226 44.1	86	14	06.5 +117	
16	0	263 29.4	202 06.2	+19	45.3	158 32.5	+23	49.4	140 34.6	+20	32.2	39 51.3	-14	06.6	241 11.7	86	+14	18.2 +116
	1	278 31.8	217 05.6		46.0	173 33.2		49.2	155 36.5		32.1	54 53.9		06.6	255 39.3	85	14	29.8 +116
	2	293 34.3	232 04.9		46.7	188 33.9		49.0	170 38.5		32.0	69 56.5		06.6	270 06.8	83	14	41.4 +115
	3	308 36.8	247 04.2	..	47.3	203 34.6	..	48.9	185 40.4	..	31.9	84 59.1	..	06.5	284 34.1	83	-14	52.9 +114
	4	323 39.2	262 03.5		48.0	218 35.3		48.7	200 42.4		31.8	100 01.7		06.5	299 01.4	82	15	04.3 +113
	5	338 41.7	277 02.8		48.6	233 36.0		48.6	215 44.3		31.7	115 04.3		06.5	313 28.6	80	15	15.6 +113
	6	353 44.1	292 02.1	+19	49.3	248 36.7	+23	48.4	230 46.3	+20	31.6	130 06.8	-14	06.5	327 55.6	80	+15	26.9 +112
	7	8 46.6	307 01.4		50.0	263 37.5		48.2	245 48.2		31.5	145 09.4		06.4	342 22.6	78	15	38.1 +111
	8	23 49.1	322 00.8		50.6	278 38.2		48.1	260 50.2		31.3	160 12.0		06.4	356 49.4	77	15	49.2 +110
	9	38 51.5	337 00.1	..	51.3	293 38.9	..	47.9	275 52.1	..	31.2	175 14.6	..	06.4	11 16.1	77	16	00.2 +109
	10	53 54.0	351 59.4		51.9	308 39.6		47.7	290 54.1		31.1	190 17.2		06.3	25 42.8	75	16	11.1 +108
	11	68 56.5	6 58.7		52.6	323 40.3		47.6	305 56.0		31.0	205 19.8		06.3	40 09.3	74	16	21.9 +108
	12	83 58.9	21 58.0	+19	53.2	338 41.0	+23	47.4	320 58.0	+20	30.9	220 22.4	-14	06.3	54 35.7	73	+16	32.7 +106
	13	99 01.4	36 57.3		53.9	353 41.7		47.3	335 59.9		30.8	235 25.0		06.3	69 02.0	72	16	43.3 +106
	14	114 03.9	51 56.6		54.5	8 42.4		47.1	351 01.9		30.7	250 27.5		06.2	83 28.2	71	16	53.9 +104
	15	129 06.3	66 55.9	..	55.2	23 43.1	..	46.9	6 03.8	..	30.6	265 30.1	..	06.2	97 54.3	70	17	04.3 +104
	16	144 08.8	81 55.2		55.8	38 43.8		46.8	21 05.8		30.5	280 32.7		06.2	112 20.3	68	17	14.7 +103
	17	159 11.3	96 54.5		56.5	53 44.5		46.6	36 07.7		30.4	295 35.3		06.2	126 46.1	68	17	25.0 +102
	18	174 13.7	111 53.9	+19	57.1	68 45.2	+23	46.4	51 09.7	+20	30.3	310 37.9	-14	06.1	141 11.9	67	+17	35.2 +100
	19	189 16.2	126 53.2		57.8	83 45.9		46.3	66 11.6		30.2	325 40.5		06.1	155 37.6	65	17	45.2 +100
	20	204 18.6	141 52.5		58.4	98 46.6		46.1	81 13.5		30.1	340 43.1		06.1	170 03.1	64	17	55.2 + 98
	21	219 21.1	156 51.8	..	59.1	113 47.3	..	45.9	96 15.5	..	30.0	355 45.7	..	06.0	184 28.5	64	-18	05.0 + 98
	22	234 23.6	171 51.1	19	59.7	128 48.0		45.8	111 17.4		29.9	10 48.2		06.0	198 53.9	62	18	14.8 + 96
	23	249 26.0	186 50.4	20	00.4	143 48.7		45.6	126 19.4		29.8	25 50.8		06.0	213 19.1	61	18	24.4 + 96
17	0	264 28.5	201 49.7	+20	01.0	158 49.4	+23	45.4	141 21.3	+20	29.7	40 53.4	-14	06.0	227 44.2	60	+18	34.0 + 94
	1	279 31.0	216 49.0		01.6	173 50.1		45.3	156 23.3		29.5	55 56.0		05.9	242 09.2	59	18	43.4 + 93
	2	294 33.4	231 48.3		02.3	188 50.9		45.1	171 25.2		29.4	70 58.6		05.9	256 34.1	58	18	52.7 + 92
	3	309 35.9	246 47.6	..	02.9	203 51.6	..	44.9	186 27.2	..	29.3	86 01.2	..	05.9	270 58.9	57	-19	01.9 + 90
	4	324 38.4	261 46.9		03.6	218 52.3		44.8	201 29.1		29.2	101 03.8		05.9	285 23.6	56	19	10.9 + 90
	5	339 40.8	276 46.2		04.2	233 53.0		44.6	216 31.1		29.1	116 06.4		05.8	299 48.2	54	19	19.9 + 88
	6	354 43.3	291 45.5	+20	04.8	248 53.7	+23	44.4	231 33.0	+20	29.0	131 08.9	-14	05.8	314 12.6	54	+19	28.7 + 87
	7	9 45.7	306 44.8		05.5	263 54.4		44.3	246 35.0		28.9	146 11.5		05.8	328 37.0	53	19	37.4 + 86
	8	24 48.2	321 44.1		06.1	278 55.1		44.1	261 36.9		28.8	161 14.1		05.8	343 01.3	51	19	46.0 + 84
	9	39 50.7	336 43.4	..	06.7	293 55.8	..	43.9	276 38.8	..	28.7	176 16.7	..	05.7	357 25.4	51	-19	54.4 + 83
	10	54 53.1	351 42.7		07.4													

G M T	SUN			STARS			Lat.	Sunrise	Twit. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS																		
	GHA	Dec.	No.	Name	SHA	Dec.								Sun's Lower Limb Add	Venus Add	Mars Add																
										15	16	17	18																			
h	°	'	°	°	'	°	N	h	m	h	m	h	m	h	m	Alt.	°	'	°	'												
15	0	179	58.7	+23	16.0	7	Acamar	315	51.6	-40	28.7	72	□	□	22	34	21	03	□	□	Alt.	°	'	°	'							
	1	194	58.6		16.1	5	Achernar	335	59.3	-57	27.4	70	□	□	23	01	22	28	□	□		0	0.1	0.1	0.1							
	2	209	58.4		16.3	30	Acrux	173	57.9	-62	51.6	68	□	□	23	21	23	08	22	38	□	30	0.1	0.1	0.0							
	3	224	58.3	..	16.4	19	Adhara	255	47.1	-28	54.7	66	□	□	23	38	23	36	23	47	□	45	0.1	0.1	0.0							
	4	239	58.2		16.5	10	Aldebaran	291	39.6	+16	25.3	64	1	33	///	23	51	23	57	24	10	60	0.1	0.0	0.0							
	5	254	58.0		16.6							62	2	10	///	24	02	0	02	0	15	0	0.1	0.1	0.0							
	6	269	57.9	+23	16.7	32	Alioth	166	58.5	+56	12.2	60	2	36	///	0	00	0	12	0	29	0	0.1	0.1	0.0							
	7	284	57.8		16.9	34	Alkaid	153	32.8	+49	32.2	58	2	56	///	0	05	0	21	0	41	1	0.1	0.1	0.0							
	8	299	57.6		17.0	55	Al Na'ir	28	38.0	-47	10.3	56	3	13	///	0	10	0	28	0	52	1	0.1	0.0	0.0							
	9	314	57.5	..	17.1	15	Alnilam	276	30.8	-1	13.7	54	3	27	///	0	14	0	35	1	02	1	0.1	0.0	0.0							
	10	329	57.4		17.2	25	Alphard	218	39.0	-8	28.0	52	3	39	///	0	18	0	41	1	10	1										
	11	344	57.2		17.3							50	3	50	///	0	21	0	46	1	18	1										
	12	359	57.1	+23	17.5	41	Alphecca	126	47.5	+26	51.8	45	4	13	1	41	0	29	0	58	1	34	2									
	13	14	57.0		17.6	1	Alpheratz	358	28.6	+28	50.6	40	4	30	2	27	0	35	1	08	1	48	2									
	14	29	56.8		17.7	51	Altair	62	50.3	+8	45.0	35	4	45	2	58	0	40	1	17	1	59	2									
	15	44	56.7	..	17.8	2	Ankaa	353	58.6	-42	32.5	30	4	58	3	22	0	45	1	25	2	09	3									
	16	59	56.6		17.9	42	Antares	113	19.2	-26	20.2	20	5	20	3	56	0	54	1	38	2	27	3									
	17	74	56.4		18.0							10	5	39	4	21	1	01	1	49	2	42	3									
	18	89	56.3	+23	18.1	37	Arcturus	146	35.1	+19	24.8	0	5	57	4	42	1	08	2	00	2	57	3									
	19	104	56.2		18.2	43	Atria	108	59.6	-68	57.0	10	6	14	4	59	1	15	2	11	3	11	4									
	20	119	56.0		18.3	22	Avior	234	36.4	-59	22.2	20	6	33	5	13	1	23	2	23	3	27	4									
	21	134	55.9	..	18.5	13	Bellatrix	279	19.0	+6	18.6	30	6	54	5	29	1	32	2	37	3	45	4									
	22	149	55.8		18.6	16	Betelge'se	271	48.7	+7	24.0	35	7	06	5	35	1	37	2	45	3	55	5									
	23	164	55.6		18.7							40	7	20	5	42	1	43	2	54	4	08	5									
						17	Canopus	264	16.0	-52	40.3	45	7	37	5	50	1	49	3	05	4	22	5									
						12	Capella	281	39.2	+45	57.3	50	7	57	5	58	1	58	3	18	4	40	6									
						53	Deneb	50	00.8	+45	07.1	52	8	07	6	01	2	01	3	24	4	48	6									
						28	Denebola	183	17.9	+14	49.2	54	8	18	6	05	2	06	3	31	4	58	6									
						4	Diphda	349	39.5	-18	13.6	56	8	31	6	09	2	10	3	38	5	08	6									
												58	8	46	6	12	2	16	3	47	5	20	6									
												60	9	03	6	17	2	21	3	57	5	34	7									
												S																				
												Lat.	Sunset	Twit. ends	Moonset																	
												N	h	m	h	m	h	m	h	m	h	m	Alt.	°	'	°	'					
												72	□	□	16	35	20	02	□	□			80	16.6	16.9	17.3						
												70	□	□	16	10	18	37	□	□			84	16.4	16.7	17.0						
												68	□	□	15	51	17	59	20	34			88	16.3	16.5	16.8						
												66	□	□	15	36	17	32	19	36	21	39	90	16.2	16.4	16.6						
												64	22	29	///	15	24	17	12	19	03	20	44									
												62	21	52	///	15	14	16	55	18	38	20	12									
												60	21	25	///	15	05	16	42	18	19	19	48									
												58	21	05	///	14	58	16	30	18	03	19	28									
												56	20	48	///	14	51	16	20	17	49	19	12									
												54	20	34	///	14	45	16	11	17	38	18	58									
												52	20	22	///	14	40	16	03	17	27	18	46									
												50	20	11	///	14	35	15	56	17	18	18	36									
												45	19	49	22	22	14	25	15	41	16	59	18	13								
												40	19	31	21	34	14	16	15	29	16	43	17	55								
												35	19	16	21	03	14	09	15	18	16	30	17	40								
												30	19	03	20	40	14	02	15	09	16	18	17	27								
												20	18	41	20	05	13	51	14	53	15	58	17	05								
												10	18	22	19	40	13	41	14	39	15	41	16	46								
												0	18	04	19	19	13	32	14	26	15	25	16	28								
												10	17	47	19	02	13	23	14	14	15	09	16	10								
												20	17	28	18	47	13	14	14	00	14	52	15	50								
												30	17	07	18	32	13	03	13	44	14	33	15	28								
												35	16	55	18	26	12	57	13	35	14	21	15	15								
												40	16	41	18	19	12	49	13	25	14	08	15	00								
												45	16	24	18	11	12	41	13	13	13	53	14	42								
												50	16	03	18	02	12	31	12	59	13	34	14	20								
												52	15	53	17	59	12	27	12	52	13	25	14	10								
												54	15	42	17	55	12	22	12	45	13	15	15	58								
												56	15	30	17	52	12	16	12	36	13	04	13	45								
												58	15	15	17	48	12	10	12	27	12	52	13	29								
												60	14	58	17	44	12	03	12	16	12	37	13	10								
												S																				
												G M T	Equation of Time (App. Mean)			GMT of Transit Meridian of Greenwich																
													15	16	17	DAY	Moon	Venus	Mars	Jupiter	Saturn											
												h	m	s	m	s	h	m	h	m	h	m	h	m	h	m						
												0	-	0	04.9	-	0	17.7	-	0	30.6											
												6	-	0	08.1	-	0	20.9	-	0	33.8	15	7	20	10	31	13	26	14	39	21	21
												12	-	0	11.3	-	0	24.1	-	0	37.1	16	8	13	10	32	13	25	14	36	21	17
												18	-	0	14.5	-	0	27.3	-	0	40.3	17	9	11	10	33	13	24	14	33	21	13
												24	-	0	17.7	-	0	30.6	-	0	43.6	18	10	13	10	34	13	23	14	30	21	09

G M T	☿		♀ VENUS — 3.3		♂ MARS 2.0		♃ JUPITER — 1.4		♄ SATURN 0.5		♁ MOON			
	GHA		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
18	h													
	0	265 27.6	201 32.9	+20 16.1	159 06.4	+23 41.3	142 08.0	+20 27.1	41 55.5	-14 05.3	213 16.0	37 +21	44.6 + 62	
	1	280 30.1	216 32.2	16.8	174 07.1	41.2	157 10.0	27.0	56 58.0	05.3	227 38.7	35 21	50.8 + 60	
	2	295 32.6	231 31.5	17.4	189 07.8	41.0	172 11.9	26.9	72 00.6	05.3	242 01.2	35 21	56.8 + 59	
	3	310 35.0	246 30.8	18.0	204 08.5	40.8	187 13.9	26.8	87 03.2	05.3	256 23.7	34 22	02.7 + 57	
	4	325 37.5	261 30.0	18.6	219 09.3	40.6	202 15.8	26.7	102 05.8	05.2	270 46.1	33 22	08.4 + 55	
	5	340 40.0	276 29.3	19.2	234 10.0	40.4	217 17.7	26.5	117 08.4	05.2	285 08.4	32 22	13.9 + 54	
	6	355 42.4	291 28.6	+20 19.8	249 10.7	+23 40.3	232 19.7	+20 26.4	132 11.0	-14 05.2	299 30.6	32 +22	19.3 + 52	
	7	10 44.9	306 27.9	20.4	264 11.4	40.1	247 21.6	26.3	147 13.5	05.2	313 52.8	31 22	24.5 + 51	
	8	25 47.4	321 27.2	21.1	279 12.1	39.9	262 23.6	26.2	162 16.1	05.1	328 14.9	30 22	29.6 + 49	
	9	40 49.8	336 26.5	21.7	294 12.8	39.7	277 25.5	26.1	177 18.7	05.1	342 36.9	29 22	34.5 + 47	
	10	55 52.3	351 25.8	22.3	309 13.5	39.6	292 27.5	26.0	192 21.3	05.1	356 58.8	29 22	39.2 + 46	
	11	70 54.7	6 25.1	22.9	324 14.2	39.4	307 29.4	25.9	207 23.9	05.1	11 20.7	28 22	43.8 + 43	
	12	85 57.2	21 24.4	+20 23.5	339 14.9	+23 39.2	322 31.3	+20 25.8	222 26.5	-14 05.0	25 42.5	27 +22	48.1 + 43	
	13	100 59.7	36 23.7	24.1	354 15.6	39.0	337 33.3	25.7	237 29.0	05.0	40 04.2	27 22	52.4 + 40	
	14	116 02.1	51 22.9	24.7	9 16.3	38.8	352 35.2	25.6	252 31.6	05.0	54 25.9	26 22	56.4 + 39	
	15	131 04.6	66 22.2	25.3	24 17.1	38.7	7 37.2	25.5	267 34.2	05.0	68 47.5	26 23	00.3 + 37	
	16	146 07.1	81 21.5	25.9	39 17.8	38.5	22 39.1	25.4	282 36.8	04.9	83 09.1	25 23	04.0 + 35	
	17	161 09.5	96 20.8	26.5	54 18.5	38.3	37 41.1	25.3	297 39.4	04.9	97 30.6	25 23	07.5 + 34	
	18	176 12.0	111 20.1	+20 27.1	69 19.2	+23 38.1	52 43.0	+20 25.1	312 41.9	-14 04.9	111 52.1	24 +23	10.9 + 31	
	19	191 14.5	126 19.4	27.7	84 19.9	37.9	67 44.9	25.0	327 44.5	04.9	126 13.5	24 23	14.0 + 30	
	20	206 16.9	141 18.7	28.3	99 20.6	37.8	82 46.9	24.9	342 47.1	04.8	140 34.9	23 23	17.0 + 29	
	21	221 19.4	156 17.9	28.9	114 21.3	37.6	97 48.8	24.8	357 49.7	04.8	154 56.2	23 23	19.9 + 26	
	22	236 21.9	171 17.2	29.5	129 22.0	37.4	112 50.8	24.7	12 52.3	04.8	169 17.5	22 23	22.5 + 25	
	23	251 24.3	186 16.5	30.1	144 22.7	37.2	127 52.7	24.6	27 54.9	04.8	183 38.7	22 23	25.0 + 23	
19	0	266 26.8	201 15.8	+20 30.7	159 23.5	+23 37.0	142 54.7	+20 24.5	42 57.4	-14 04.7	197 59.9	22 +23	27.3 + 21	
	1	281 29.2	216 15.1	31.3	174 24.2	36.9	157 56.6	24.4	58 00.0	04.7	212 21.1	21 23	29.4 + 19	
	2	296 31.7	231 14.4	31.9	189 24.9	36.7	172 58.5	24.3	73 02.6	04.7	226 42.2	21 23	31.3 + 17	
	3	311 34.2	246 13.6	32.5	204 25.6	36.5	188 00.5	24.2	88 05.2	04.7	241 03.3	21 23	33.0 + 16	
	4	326 36.6	261 12.9	33.1	219 26.3	36.3	203 02.4	24.1	103 07.8	04.6	255 24.4	20 23	34.6 + 14	
	5	341 39.1	276 12.2	33.7	234 27.0	36.1	218 04.4	23.9	118 10.3	04.6	269 45.4	21 23	36.0 + 12	
	6	356 41.6	291 11.5	+20 34.3	249 27.7	+23 35.9	233 06.3	+20 23.8	133 12.9	-14 04.6	284 06.5	20 +23	37.2 + 10	
	7	11 44.0	306 10.8	34.9	264 28.4	35.8	248 08.3	23.7	148 15.5	04.6	298 27.5	20 23	38.2 + 8	
	8	26 46.5	321 10.0	35.5	279 29.1	35.6	263 10.2	23.6	163 18.1	04.5	312 48.5	20 23	39.0 + 7	
	9	41 49.0	336 09.3	36.1	294 29.9	35.4	278 12.1	23.5	178 20.7	04.5	327 09.5	19 23	39.7 + 4	
	10	56 51.4	351 08.6	36.7	309 30.6	35.2	293 14.1	23.4	193 23.2	04.5	341 30.4	20 23	40.1 + 3	
	11	71 53.9	6 07.9	37.2	324 31.3	35.0	308 16.0	23.3	208 25.8	04.5	355 51.4	20 23	40.4 + 1	
	12	86 56.4	21 07.2	+20 37.8	339 32.0	+23 34.8	323 18.0	+20 23.2	223 28.4	-14 04.4	10 12.4	19 +23	40.5 - 1	
	13	101 58.8	36 06.4	38.4	354 32.7	34.6	338 19.9	23.1	238 31.0	04.4	24 33.3	20 23	40.4 - 3	
	14	117 01.3	51 05.7	39.0	9 33.4	34.5	353 21.8	23.0	253 33.5	04.4	38 54.3	20 23	40.1 - 4	
	15	132 03.7	66 05.0	39.6	24 34.1	34.3	8 23.8	22.9	268 36.1	04.4	53 15.3	19 23	39.7 - 7	
	16	147 06.2	81 04.3	40.2	39 34.9	34.1	23 25.7	22.8	283 38.7	04.3	67 36.2	20 23	39.0 - 8	
	17	162 08.7	96 03.5	40.7	54 35.6	33.9	38 27.7	22.6	298 41.3	04.3	81 57.2	20 23	38.2 - 10	
	18	177 11.1	111 02.8	+20 41.3	69 36.3	+23 33.7	53 29.6	+20 22.5	313 43.9	-14 04.3	96 18.2	20 +23	37.2 - 12	
	19	192 13.6	126 02.1	41.9	84 37.0	33.5	68 31.5	22.4	328 46.4	04.3	110 39.2	20 23	36.0 - 14	
	20	207 16.1	141 01.4	42.5	99 37.7	33.3	83 33.5	22.3	343 49.0	04.2	125 00.2	21 23	34.6 - 16	
	21	222 18.5	156 00.6	43.1	114 38.4	33.1	98 35.4	22.2	358 51.6	04.2	139 21.3	20 23	33.0 - 17	
	22	237 21.0	170 59.9	43.6	129 39.1	32.9	113 37.4	22.1	13 54.2	04.2	153 42.3	21 23	31.3 - 19	
	23	252 23.5	185 59.2	44.2	144 39.8	32.8	128 39.3	22.0	28 56.7	04.2	168 03.4	21 23	29.4 - 21	
20	0	267 25.9	200 58.5	+20 44.8	159 40.6	+23 32.6	143 41.2	+20 21.9	43 59.3	-14 04.1	182 24.5	22 +23	27.3 - 23	
	1	282 28.4	215 57.7	45.4	174 41.3	32.4	158 43.2	21.8	59 01.9	04.1	Partial eclipse of Sun			
	2	297 30.8	230 57.0	45.9	189 42.0	32.2	173 45.1	21.7	74 04.5	04.1	Indian Ocean and S. W.			
	3	312 33.3	245 56.3	46.5	204 42.7	32.0	188 47.1	21.5	89 07.1	04.1	Pacific. Total south of India,			
	4	327 35.8	260 55.5	47.1	219 43.4	31.8	203 49.0	21.4	104 09.6	04.0	Ceylon, central Philippine			
	5	342 38.2	275 54.8	47.6	234 44.1	31.6	218 50.9	21.3	119 12.2	04.0	Islands, north of Solomon			
	6	357 40.7	290 54.1	+20 48.2	249 44.8	+23 31.4	233 52.9	+20 21.2	134 14.8	-14 04.0	Islands.			
	7	12 43.2	305 53.4	48.8	264 45.6	31.2	248 54.8	21.1	149 17.4	04.0	282 53.3	25 23	07.5 - 35	
	8	27 45.6	320 52.6	49.3	279 46.3	31.0	263 56.8	21.0	164 19.9	04.0	297 14.8	25 23	04.0 - 38	
	9	42 48.1	335 51.9	49.9	294 47.0	30.8	278 58.7	20.9	179 22.5	03.9	311 36.3	25 23	00.2 - 38	
	10	57 50.6	350 51.2	50.5	309 47.7	30.7	294 00.6	20.8	194 25.1	03.9	325 57.8	26 22	56.4 - 41	
	11	72 53.0	5 50.4	51.0	324 48.4	30.5	309 02.6	20.7	209 27.7	03.9	340 19.4	26 22	52.3 - 42	
	12	87 55.5	20 49.7	+20 51.6	339 49.1	+23 30.3	324 04.5	+20 20.6	224 30.2	-14 03.9	354 41.0	28 +22	48.1 - 44	
	13	102 58.0	35 49.0	52.2	354 49.9	30.1	339 06.5	20.4	239 32.8	03.8	9 02.8	27 22	43.7 - 46	
	14	118 00.4	50 48.2	52.7	9 50.6	29.9	354 08.4	20.3	254 35.4	03.8	23 24.5	29 22	39.1 - 47	
	15	133 02.9	65 47.5	53.3	24 51.3	29.7	9 10.3	20.2	269 38.0	03.8	37 46.4	29 22	34.4 - 50	
	16	148 05.3	80 46.8	53.8	39 52.0	29.5	24 12.3	20.1	284 40.5	03.8	52 08.3	29 22	29.4 - 50	
	17	163 07.8	95 46.0	54.4	54 52.7	29.3	39 14.2	20.0	299 43.1	03.7	66 30.2	31 22	24.4 - 53	
	18	178 10.3	110 45.3	+20 55.0	69 53.4	+23 29.1	54 16.2	+20 19.9	314 45.7	-14 03.7	80 52.3	31 +22	19.1 - 54	
	19	193 12.7	125 44.6	55.5	84 54.1	28.9	69 18.1	19.8	329 48.3	03.7	95 14.4	32 22	13.7 - 55	
	20	208 15.2	140 43.8	56.1	99 54.9	28.7	84 20.0	19.7	344 50.8	03.7	109 36.6	33 22	08.2 - 58	
	21	223 17.7	155 43.1	56.6	114 55.6	28.5	99 22.0	19.6	359 53.4	03.7	123 58.9	33 22	02.4 - 59	
	22	238 20.1	170 42.3	57.2	129 56.3	28.3	114 23.9	19.5	14 56.0	03.6	138 21.2	34 21	56.5 - 60	
	23	253 22.6	185 41.6	57.7	144 57.0	28.1	129 25.8	19.3	29 58.6	03.6	152 43.6	35 21	50.5 - 62	
	24	268 25.1	200 40.9	+20 58.3	159 57.7	+23 27.9	144 27.8	+20 19.2	45 01.1	-14 03.6	167 06.1	36 +21	44.3 - 64	
code	—	—	- 8	+ 6	+ 7	- 2	+ 19	- 1	+ 26	0				

G M T	SUN			STARS			Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS							
	GHA	Dec.	No.	Name	SHA	Dec.				18	19	20	21	Alt.	Sun's Low'r Limb	Venus	Mars				
h	°	'	°				N	h	m	h	m	h	m	h	m	°	'	'	'		
18	0	179 49.0	+23 23.1	7	Acamar	315 51.6	-40 28.7	72													
	1	194 48.9	23.1	5	Achernar	335 59.2	-57 27.4	70													
	2	209 48.8	23.2	30	Acruz	173 57.9	-62 51.6	68							1 54						
	3	224 48.6	23.3	19	Adhara	255 47.1	-28 54.7	66				23 47	24 53	0 53	2 55						
	4	239 48.5	23.3	10	Aldebaran	291 39.6	+16 25.3	64	1 31	////	0 10	0 42	1 49	3 30							
	5	254 48.4	23.4					62	2 09	////	0 36	1 15	2 22	3 55							
	6	269 48.2	+23 23.5	32	Alioth	166 58.5	+56 12.2	60	2 35	////	0 55	1 39	2 46	4 15							
	7	284 48.1	23.6	34	Alkaid	153 32.8	+49 32.2	58	2 56	////	1 12	1 59	3 06	4 31							
	8	299 48.0	23.6	55	Al Na'ir	28 37.9	-47 10.3	56	3 13	////	1 26	2 15	3 22	4 45							
	9	314 47.8	23.7	15	Alnilam	276 30.8	-1 13.7	54	3 27	////	1 38	2 29	3 36	4 56							
	10	329 47.7	23.7	25	Alphard	218 39.0	-8 28.0	52	3 39	////	1 49	2 41	3 48	5 07							
	11	344 47.5	23.8					50	3 50	////	1 58	2 52	3 59	5 16							
	12	359 47.4	+23 23.9	41	Alphecca	126 47.5	+26 51.8	45	4 13	1 40	2 19	3 14	4 21	5 36							
	13	14 47.3	23.9	1	Alpheratz	358 28.6	+28 50.6	40	4 31	2 28	2 35	3 32	4 39	5 52							
	14	29 47.1	24.0	51	Altair	62 50.3	+8 45.0	35	4 46	2 59	2 49	3 48	4 54	6 05							
	15	44 47.0	24.1	2	Ankaa	353 58.5	-42 32.5	30	4 59	3 22	3 01	4 01	5 07	6 17							
	16	59 46.9	24.1	42	Antares	113 19.2	-26 20.2	20	5 21	3 57	3 22	4 24	5 30	6 37							
	17	74 46.7	24.2					10	5 40	4 22	3 40	4 43	5 49	6 54							
	18	89 46.6	+23 24.2	37	Arcturus	146 35.1	+19 24.8	0	5 57	4 42	3 58	5 02	6 07	7 10							
	19	104 46.5	24.3	43	Atria	108 59.6	-68 57.1	10	6 15	5 00	4 15	5 20	6 25	7 26							
	20	119 46.3	24.4	22	Avior	234 36.4	-59 22.2	20	6 33	5 14	4 33	5 40	6 44	7 43							
	21	134 46.2	24.4	13	Bellatrix	279 19.0	+6 18.6	30	6 55	5 28	4 55	6 03	7 07	8 03							
	22	149 46.0	24.5	16	Betelge'se	271 48.7	+7 24.0	35	7 07	5 36	5 07	6 17	7 20	8 15							
	23	164 45.9	24.5					40	7 21	5 43	5 22	6 32	7 35	8 28							
				17	Canopus	264 16.0	-52 40.3	45	7 38	5 51	5 39	6 51	7 53	8 43							
				12	Capella	281 39.2	+45 57.3	50	7 59	5 59	6 01	7 14	8 15	9 02							
				53	Deneb	50 00.8	+45 07.2	52	8 09	6 02	6 11	7 25	8 26	9 11							
				28	Denebola	183 17.9	+14 49.2	54	8 20	6 06	6 22	7 38	8 38	9 21							
				4	Diphda	349 39.5	-18 13.6	56	8 33	6 10	6 36	7 52	8 51	9 32							
				27	Dubhe	194 44.9	+61 59.7	58	8 47	6 14	6 51	8 09	9 07	9 45							
				14	Elnath	279 08.0	+28 34.3	60	9 05	6 18	7 10	8 30	9 26	10 00							
				47	Eltanin	91 05.8	+51 29.6	S													
				54	Enif	34 29.6	+9 40.3	Lat.	Sunset	Twlt. ends	Moonset										
				56	Fomalhaut	16 11.7	-29 51.2	N	h	m	h	m	h	m	h	m					
				31	Gacrux	172 49.4	-56 52.2	72													
				29	Gienah	176 37.0	-17 17.9	70													
				35	Hadar	149 49.3	-60 09.9	68													
				6	Hamal	328 50.1	+23 15.1	66													
				48	Kaus Aust.	84 41.0	-34 24.4	64	22 32	////	20 44	21 54	22 27	22 41							
				40	Kochab	137 17.0	+74 20.4	62	21 53	////	20 12	21 21	22 01	22 23							
				57	Markab	14 21.6	+14 57.9	60	21 27	////	19 48	20 56	21 41	22 08							
				8	Menkar	315 00.8	+3 55.0	58	21 06	////	19 28	20 37	21 24	21 56							
				36	Menkent	148 58.7	-36 09.4	56	20 50	////	19 12	20 20	21 10	21 45							
				24	Miapl'dus	221 49.7	-69 32.4	54	20 35	////	18 58	20 06	20 58	21 35							
				9	Mirfak	309 43.1	+49 42.2	52	20 23	////	18 46	19 54	20 47	21 27							
				50	Nunki	76 51.8	-26 21.2	50	20 12	////	18 36	19 43	20 37	21 19							
				52	Peacock	54 27.1	-56 52.5	45	19 50	22 23	18 13	19 21	20 17	21 02							
				21	Pollux	244 21.1	+28 08.1	40	19 32	21 35	17 55	19 02	20 00	20 49							
				20	Procyon	245 45.5	+5 20.4	35	19 16	21 03	17 40	18 47	19 46	20 37							
				46	R'alhague	96 46.4	+12 35.5	30	19 03	20 40	17 27	18 34	19 34	20 27							
				26	Regulus	208 29.9	+12 11.1	20	18 41	20 05	17 05	18 11	19 13	20 09							
				11	Rigel	281 54.2	-8 15.1	10	18 22	19 40	16 46	17 51	18 55	19 53							
				38	Rigel Kent.	140 50.8	-60 39.5	0	18 05	19 20	16 28	17 33	18 37	19 39							
				44	Sabik	103 02.0	-15 40.3	10	17 48	19 03	16 10	17 14	18 20	19 24							
				3	Schedar	350 30.3	+56 17.4	20	17 29	18 48	15 50	16 54	18 01	19 08							
				45	Shaula	97 20.5	-37 04.4	30	17 08	18 34	15 28	16 31	17 40	18 50							
				18	Sirius	259 12.4	-16 39.3	35	16 55	18 26	15 15	16 18	17 27	18 39							
				33	Spica	159 17.0	-10 55.9	40	16 41	18 19	15 00	16 02	17 12	18 27							
				23	Suhail	223 24.8	-43 15.4	45	16 24	18 11	14 42	15 44	16 55	18 12							
				49	Vega	81 08.0	+38 44.5	50	16 04	18 04	14 20	15 21	16 34	17 54							
				39	Zub'g'bi	137 53.3	-15 51.6	52	15 54	18 00	14 10	15 09	16 23	17 46							
				G	Equation of Time (App. Mean)				GMT of Transit Meridian of Greenwich												
				M	18	19	20														
				h	m	s	m	s	DAY	Moon	Venus	Mars	Jupiter	Saturn							
				0	- 0 43.6	- 0 56.6	- 1 09.8		18	10 13	10 34	13 23	14 30	21 09							
				6	- 0 46.8	- 0 59.9	- 1 13.0		19	11 17	10 35	13 22	14 27	21 05							
				12	- 0 50.1	- 1 03.2	- 1 16.3		20	12 22	10 37	13 21	14 23	21 00							
				18	- 0 53.4	- 1 06.5	- 1 19.6		21	13 25	10 38	13 20	14 20	20 56							
				24	- 0 56.6	- 1 09.8	- 1 22.9														
				179 39.2	+23 26.4																

G M T	↑ GHA	VENUS - 3.3		MARS 2.0		JUPITER - 1.4		SATURN 0.5		MOON			
		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
21	0	268 25.1	200 40.9	+20 58.3	159 57.7	+23 27.9	144 27.8	+20 19.2	45 01.1	-14 03.6	167 06.1	36 +21 44.3	- 64
	1	283 27.5	215 40.1	58.8	174 58.4	27.7	159 29.7	19.1	60 03.7	03.6	181 28.7	37 21 37.9	- 65
	2	298 30.0	230 39.4	59.4	189 59.2	27.5	174 31.7	19.0	75 06.3	03.5	195 51.4	38 21 31.4	- 66
	3	313 32.5	245 38.7	+20 59.9	204 59.9	.. 27.3	189 33.6	.. 18.9	90 08.9	.. 03.5	210 14.2	38 +21 24.8	- 68
	4	328 34.9	260 37.9	21 00.5	220 00.6	27.1	204 35.5	18.8	105 11.4	03.5	224 37.0	40 21 18.0	- 70
	5	343 37.4	275 37.2	01.0	235 01.3	26.9	219 37.5	18.7	120 14.0	03.5	239 00.0	40 21 11.0	- 71
	6	358 39.8	290 36.4	+21 01.6	250 02.0	+23 26.7	234 39.4	+20 18.6	135 16.6	-14 03.5	253 23.0	41 +21 03.9	- 73
	7	13 42.3	305 35.7	02.1	265 02.7	26.5	249 41.3	18.5	150 19.1	03.4	267 46.1	43 20 56.6	- 74
	8	28 44.8	320 35.0	02.7	280 03.5	26.3	264 43.3	18.3	165 21.7	03.4	282 09.4	43 20 49.2	- 75
	9	43 47.2	335 34.2	.. 03.2	295 04.2	.. 26.1	279 45.2	.. 18.2	180 24.3	.. 03.4	296 32.7	44 +20 41.7	- 77
	10	58 49.7	350 33.5	03.7	310 04.9	25.9	294 47.2	18.1	195 26.9	03.4	310 56.1	45 20 34.0	- 78
	11	73 52.2	5 32.7	04.3	325 05.6	25.7	309 49.1	18.0	210 29.4	03.3	325 19.6	46 20 26.2	- 80
	12	88 54.6	20 32.0	+21 04.8	340 06.3	+23 25.5	324 51.0	+20 17.9	225 32.0	-14 03.3	339 43.2	47 +20 18.2	- 81
	13	103 57.1	35 31.2	05.4	355 07.1	25.3	339 53.0	17.8	240 34.6	03.3	354 06.9	48 20 10.1	- 82
	14	118 59.6	50 30.5	05.9	10 07.8	25.1	354 54.9	17.7	255 37.2	03.3	8 30.7	49 20 01.9	- 84
	15	134 02.0	65 29.8	.. 06.4	25 08.5	.. 24.9	9 56.8	.. 17.6	270 39.7	.. 03.3	22 54.6	51 +19 53.5	- 85
	16	149 04.5	80 29.0	07.0	40 09.2	24.7	24 58.8	17.5	285 42.3	03.2	37 18.7	51 19 45.0	- 86
	17	164 07.0	95 28.3	07.5	55 09.9	24.5	40 00.7	17.3	300 44.9	03.2	51 42.8	52 19 36.4	- 88
	18	179 09.4	110 27.5	+21 08.0	70 10.7	+23 24.3	55 02.7	+20 17.2	315 47.4	-14 03.2	66 07.0	53 +19 27.6	- 88
	19	194 11.9	125 26.8	08.6	85 11.4	24.1	70 04.6	17.1	330 50.0	03.2	80 31.3	55 19 18.8	- 90
	20	209 14.3	140 26.0	09.1	100 12.1	23.9	85 06.5	17.0	345 52.6	03.1	94 55.8	55 19 09.8	- 91
	21	224 16.8	155 25.3	.. 09.6	115 12.8	.. 23.7	100 08.5	.. 16.9	0 55.2	.. 03.1	109 20.3	57 +19 00.7	- 93
	22	239 19.3	170 24.5	10.2	130 13.5	23.5	115 10.4	16.8	15 57.7	03.1	123 45.0	57 18 51.4	- 93
	23	254 21.7	185 23.8	10.7	145 14.2	23.3	130 12.3	16.7	31 00.3	03.1	138 09.7	59 18 42.1	- 95
22	0	269 24.2	200 23.0	+21 11.2	160 15.0	+23 23.1	145 14.3	+20 16.6	46 02.9	-14 03.1	152 34.6	59 +18 32.6	- 96
	1	284 26.7	215 22.3	11.7	175 15.7	22.9	160 16.2	16.4	61 05.4	03.0	166 59.5	61 18 23.0	- 97
	2	299 29.1	230 21.5	12.3	190 16.4	22.7	175 18.1	16.3	76 08.0	03.0	181 24.6	62 18 13.3	- 98
	3	314 31.6	245 20.8	.. 12.8	205 17.1	.. 22.5	190 20.1	.. 16.2	91 10.6	.. 03.0	195 49.8	63 +18 03.5	- 99
	4	329 34.1	260 20.0	13.3	220 17.8	22.3	205 22.0	16.1	106 13.1	03.0	210 15.1	64 17 53.6	-100
	5	344 36.5	275 19.3	13.8	235 18.6	22.1	220 24.0	16.0	121 15.7	03.0	224 40.5	65 17 43.6	-102
	6	359 39.0	290 18.5	+21 14.4	250 19.3	+23 21.8	235 25.9	+20 15.9	136 18.3	-14 02.9	239 06.0	67 +17 33.4	-102
	7	14 41.4	305 17.8	14.9	265 20.0	21.6	250 27.8	15.8	151 20.9	02.9	253 31.7	67 17 23.2	-103
	8	29 43.9	320 17.0	15.4	280 20.7	21.4	265 29.8	15.7	166 23.4	02.9	267 57.4	68 17 12.9	-104
	9	44 46.4	335 16.3	.. 15.9	295 21.4	.. 21.2	280 31.7	.. 15.6	181 26.0	.. 02.9	282 23.2	70 +17 02.5	-106
	10	59 48.8	350 15.5	16.4	310 22.2	21.0	295 33.6	15.4	196 28.6	02.8	296 49.2	71 16 51.9	-106
	11	74 51.3	5 14.8	16.9	325 22.9	20.8	310 35.6	15.3	211 31.1	02.8	311 15.3	71 16 41.3	-107
	12	89 53.8	20 14.0	+21 17.5	340 23.6	+23 20.6	325 37.5	+20 15.2	226 33.7	-14 02.8	325 41.4	73 +16 30.6	-108
	13	104 56.2	35 13.3	18.0	355 24.3	20.4	340 39.4	15.1	241 36.3	02.8	340 07.7	74 16 19.8	-109
	14	119 58.7	50 12.5	18.5	10 25.1	20.2	355 41.4	15.0	256 38.8	02.8	354 34.1	75 16 08.9	-110
	15	135 01.2	65 11.8	.. 19.0	25 25.8	.. 20.0	10 43.3	.. 14.9	271 41.4	.. 02.7	9 00.6	76 +15 57.9	-111
	16	150 03.6	80 11.0	19.5	40 26.5	19.8	25 45.2	14.8	286 44.0	02.7	23 27.2	78 15 46.8	-111
	17	165 06.1	95 10.3	20.0	55 27.2	19.6	40 47.2	14.7	301 46.5	02.7	37 54.0	78 15 35.7	-113
	18	180 08.6	110 09.5	+21 20.5	70 27.9	+23 19.3	55 49.1	+20 14.5	316 49.1	-14 02.7	52 20.8	79 +15 24.4	-113
	19	195 11.0	125 08.8	21.0	85 28.7	19.1	70 51.0	14.4	331 51.7	02.7	66 47.7	81 15 13.1	-114
	20	210 13.5	140 08.0	21.5	100 29.4	18.9	85 53.0	14.3	346 54.2	02.6	81 14.8	81 15 01.7	-114
	21	225 15.9	155 07.2	.. 22.1	115 30.1	.. 18.7	100 54.9	.. 14.2	1 56.8	.. 02.6	95 41.9	83 +14 50.3	-116
	22	240 18.4	170 06.5	22.6	130 30.8	18.5	115 56.9	14.1	16 59.4	02.6	110 09.2	84 14 38.7	-116
	23	255 20.9	185 05.7	23.1	145 31.6	18.3	130 58.8	14.0	32 01.9	02.6	124 36.6	84 14 27.1	-117
23	0	270 23.3	200 05.0	+21 23.6	160 32.3	+23 18.1	146 00.7	+20 13.9	47 04.5	-14 02.6	139 04.0	86 +14 15.4	-117
	1	285 25.8	215 04.2	24.1	175 33.0	17.9	161 02.7	13.8	62 07.1	02.5	153 31.6	87 14 03.7	-119
	2	300 28.3	230 03.5	24.6	190 33.7	17.6	176 04.6	13.6	77 09.6	02.5	167 59.3	88 13 51.8	-119
	3	315 30.7	245 02.7	.. 25.1	205 34.4	.. 17.4	191 06.5	.. 13.5	92 12.2	.. 02.5	182 27.1	89 +13 39.9	-119
	4	330 33.2	260 01.9	25.6	220 35.2	17.2	206 08.5	13.4	107 14.8	02.5	196 55.0	90 13 28.0	-120
	5	345 35.7	275 01.2	26.1	235 35.9	17.0	221 10.4	13.3	122 17.3	02.4	211 23.0	91 13 16.0	-121
	6	0 38.1	290 00.4	+21 26.6	250 36.6	+23 16.8	236 12.3	+20 13.2	137 19.9	-14 02.4	225 51.1	92 +13 03.9	-122
	7	15 40.6	304 59.7	27.1	265 37.3	16.6	251 14.3	13.1	152 22.5	02.4	240 19.3	93 12 51.7	-122
	8	30 43.1	319 58.9	27.6	280 38.1	16.4	266 16.2	13.0	167 25.0	02.4	254 47.6	94 12 39.5	-122
	9	45 45.5	334 58.1	.. 28.0	295 38.8	.. 16.1	281 18.1	.. 12.8	182 27.6	.. 02.4	269 16.0	95 +12 27.3	-123
	10	60 48.0	349 57.4	28.5	310 39.5	15.9	296 20.1	12.7	197 30.2	02.3	283 44.5	96 12 15.0	-124
	11	75 50.4	4 56.6	29.0	325 40.2	15.7	311 22.0	12.6	212 32.7	02.3	298 13.1	97 12 02.6	-124
	12	90 52.9	19 55.9	+21 29.5	340 41.0	+23 15.5	326 23.9	+20 12.5	227 35.3	-14 02.3	312 41.8	98 +11 50.2	-125
	13	105 55.4	34 55.1	30.0	355 41.7	15.3	341 25.9	12.4	242 37.9	02.3	327 10.6	99 11 37.7	-125
	14	120 57.8	49 54.3	30.5	10 42.4	15.1	356 27.8	12.3	257 40.4	02.3	341 39.5	99 11 25.2	-125
	15	136 00.3	64 53.6	.. 31.0	25 43.1	.. 14.9	11 29.7	.. 12.2	272 43.0	.. 02.2	356 08.4	101 +11 12.7	-126
	16	151 02.8	79 52.8	31.5	40 43.9	14.6	26 31.7	12.1	287 45.6	02.2	10 37.5	102 11 00.1	-127
	17	166 05.2	94 52.0	32.0	55 44.6	14.4	41 33.6	11.9	302 48.1	02.2	25 06.7	103 10 47.4	-127
	18	181 07.7	109 51.3	+21 32.4	70 45.3	+23 14.2	56 35.5	+20 11.8	317 50.7	-14 02.2	39 36.0	103 +10 34.7	-127
	19	196 10.2	124 50.5	32.9	85 46.0	14.0	71 37.5	11.7	332 53.3	02.2	54 05.3	105 10 22.0	-127
	20	211 12.6	139 49.7	33.4	100 46.8	13.8	86 39.4	11.6	347 55.8	02.2	68 34.8	105 10 09.3	-128
	21	226 15.1	154 49.0	.. 33.9	115 47.5	.. 13.5	101 41.3	.. 11.5	2 58.4	.. 02.1	83 04.3	107 +9 56.5	-129
	22	241 17.6	169 48.2	34.4	130 48.2	13.3	116 43.3	11.4	18 01.0	02.1	97 34.0	107 9 43.6	-129
	23	256 20.0	184 47.4	34.9	145 48.9	13.1	131 45.2	11.3	33 03.5	02.1	112 03.7	108 9 30.7	-129
24	0	271 22.5	199 46.7	+21 35.3	160 49.7	+23 12.9	146 47.1	+20 11.1	48 06.1	-14 02.1	126 33.5	109 +9 17.8	-129
code	-	-	- 7	+ 5	+ 7	- 2	+ 19	- 1	+ 26	0			

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.	No.	Name	SHA	Dec.													
										21	22	23	24	Alt.	Sun's Low'r Limb	Venus	Mars		
h	°	'			°	'	N	h	m	h	m	h	m	h	m	°	'	'	'
21	0	179 39.2 +23 26.4	7	Acamar	315 51.5	-40 28.7	72	□	□	□	□	5 57	8 17	Alt.					
	1	194 39.1 26.4	5	Achernar	335 59.2	-57 27.4	70	□	□	□	3 53	6 23	8 28	0					
	2	209 38.9 26.4	30	Acruv	173 58.0	-62 51.6	68	□	□	1 54	4 33	6 42	8 37	0					
	3	224 38.8 .. 26.4	19	Adhara	255 47.1	-28 54.7	66	□	□	2 55	5 00	6 57	8 45	0					
	4	239 38.7 26.5	10	Aldebaran	291 39.6	+16 25.3	64	1 31	////	3 30	5 21	7 09	8 51	0					
	5	254 38.5 26.5					62	2 09	////	3 55	5 38	7 20	8 57	30	0.1	0.1	0.1		
	6	269 38.4 +23 26.5	32	Alioth	166 58.5	+56 12.2	60	2 35	////	4 15	5 52	7 29	9 01	45	0.1	0.1	0.0		
	7	284 38.2 26.5	34	Alkaid	153 32.8	+49 32.2	58	2 56	////	4 31	6 04	7 37	9 06	60	0.1	0.1	0.0		
	8	299 38.1 26.5	55	Al Na'ir	287 37.9	-47 10.3	56	3 13	////	4 45	6 14	7 43	9 09	75	0.1	0.0	0.0		
	9	314 38.0 .. 26.5	15	Alnilam	276 30.8	-1 13.7	54	3 27	////	4 56	6 23	7 49	9 12	90	0.1	0.0	0.0		
	10	329 37.8 26.6	25	Alphard	218 39.0	-8 28.0	52	3 40	////	5 07	6 31	7 55	9 15						
	11	344 37.7 26.6					50	3 50	////	5 16	6 38	8 00	9 18	Moon's Lower Limb					
	12	359 37.6 +23 26.6	41	Alphecca	126 47.5	+26 51.9	45	4 13	1 40	5 36	6 54	8 10	9 24	Add					
	13	14 37.4 26.6	1	Alpheratz	358 28.5	+28 50.6	40	4 31	2 28	5 52	7 06	8 19	9 29	Alt.	21	22	23		
	14	29 37.3 26.6	51	Altair	62 50.3	+8 45.0	35	4 46	2 59	6 05	7 17	8 27	9 33	0					
	15	44 37.2 .. 26.6	2	Ankaa	353 58.5	-42 32.5	30	4 59	3 22	6 17	7 26	8 33	9 37	0					
	16	59 37.0 26.6	42	Antares	113 19.2	-26 20.2	20	5 21	3 57	6 37	7 42	8 45	9 43	0					
	17	74 36.9 26.6					10	5 40	4 22	6 54	7 56	8 54	9 49	4	20.3	19.4	18.2		
	18	89 36.7 +23 26.6	37	Arcturus	146 35.1	+19 24.8	0	5 58	4 43	7 10	8 09	9 04	9 54	8	20.2	19.4	18.2		
	19	104 36.6 26.7	43	Atria	108 59.6	-68 57.1	10	6 15	5 00	7 26	8 22	9 13	9 59	12	20.2	19.3	18.2		
	20	119 36.5 26.7	22	Avior	234 36.4	-59 22.2	20	6 34	5 15	7 43	8 36	9 23	10 05	16	20.1	19.3	18.2		
	21	134 36.3 .. 26.7	13	Bellatrix	279 19.0	+6 18.7	30	6 55	5 29	8 03	8 52	9 34	10 11	20	20.1	19.2	18.1		
	22	149 36.2 26.7	16	Betelge'se	271 48.7	+7 24.0	35	7 08	5 36	8 15	9 01	9 40	10 15	24	19.9	19.1	18.0		
	23	164 36.1 26.7					40	7 21	5 44	8 28	9 11	9 48	10 19	28	19.8	19.0	17.9		
			17	Canopus	264 16.0	-52 40.3	45	7 39	5 51	8 43	9 23	9 56	10 24	32	19.6	18.9	17.9		
22	0	179 35.9 +23 26.7	12	Capella	281 39.2	+45 57.3	50	8 00	5 59	9 02	9 38	10 06	10 29	36	19.6	18.9	17.9		
	1	194 35.8 26.7	53	Deneb	50 00.7	+45 07.2	52	8 09	6 03	9 11	9 45	10 11	10 32	40	19.5	18.7	17.8		
	2	209 35.6 26.7	28	Denebola	183 17.9	+14 49.2	54	8 21	6 06	9 21	9 53	10 16	10 35	44	19.3	18.6	17.7		
	3	224 35.5 .. 26.7	4	Diphda	349 39.5	-18 13.6	56	8 33	6 11	9 32	10 01	10 22	10 38	48	19.1	18.5	17.6		
	4	239 35.4 26.7					58	8 48	6 15	9 45	10 11	10 28	10 41	52	18.9	18.3	17.5		
	5	254 35.2 26.7	27	Dubhe	194 45.0	+61 59.7	60	9 06	6 19	10 00	10 21	10 35	10 45	56	18.7	18.1	17.4		
	6	269 35.1 +23 26.7	14	Elnath	279 07.9	+28 34.3	5							56	18.5	18.0	17.2		
	7	284 35.0 26.7	47	Eltanin	91 05.8	+51 29.6								64	18.3	17.8	17.1		
	8	299 34.8 26.7	54	Enif	34 29.6	+9 40.3								64	18.1	17.6	17.0		
	9	314 34.7 .. 26.7	56	Fomalhaut	16 11.7	-29 51.2								68	17.8	17.4	16.8		
	10	329 34.6 26.7					N.							72	17.6	17.2	16.7		
	11	344 34.4 26.7	31	Gacrux	172 49.4	-56 52.2	70	□	□	□	□	10 06	10 33	76	17.3	17.0	16.6		
	12	359 34.3 +23 26.7	29	Gienah	176 37.0	-17 17.9	72	□	□	□	10 13	10 33	10 40	80	17.1	16.8	16.4		
	13	14 34.1 26.7	35	Hadar	149 49.4	-60 09.9	68	□	□	□	10 13	10 33	10 40	84	16.8	16.6	16.3		
	14	29 34.0 26.6	6	Hamal	328 50.0	+23 15.1	66	□	□	□	10 13	10 33	10 40	88	16.6	16.4	16.2		
	15	44 33.9 .. 26.6	48	Kaus Aust.	84 41.0	-34 24.4	64	22 32	////	22 41	22 47	22 51	22 53	90	Add to table, back cover				
	16	59 33.7 26.6					62	21 54	////	22 23	22 36	22 44	22 50		Moon's Upper Limb				
	17	74 33.6 26.6	40	Kochab	137 17.0	+74 20.4	60	21 28	////	22 08	22 26	22 38	22 47		Subtract				
	18	89 33.5 +23 26.6	57	Markab	14 21.5	+14 58.0	58	21 07	////	21 56	22 17	22 33	22 45	Alt.	21	22	23		
	19	104 33.3 26.6	8	Menkar	315 00.7	+3 55.0	56	20 50	////	21 45	22 09	22 28	22 43	0					
	20	119 33.2 26.6	36	Menkent	148 58.7	-36 09.4	54	20 36	////	21 35	22 03	22 24	22 41	4	12.9	13.4	14.0		
	21	134 33.1 .. 26.6	24	Miapl'dus	221 49.7	-69 32.3	52	20 24	////	21 27	21 56	22 20	22 39	8	12.9	13.4	14.0		
	22	149 32.9 26.6					50	20 13	////	21 19	21 51	22 16	22 38	12	13.0	13.5	14.1		
	23	164 32.8 26.6	9	Mirfak	309 43.0	+49 42.2	45	19 50	22 23	21 02	21 39	22 09	22 35	16	13.0	13.5	14.1		
			50	Nunki	76 51.7	-26 21.2	40	19 32	21 35	20 49	21 28	22 02	22 32	20	13.1	13.6	14.2		
23	0	179 32.6 +23 26.5	52	Peacock	54 27.0	-56 52.5	35	19 17	21 04	20 37	21 20	21 57	22 29	24	13.2	13.7	14.2		
	1	194 32.5 26.5	21	Pollux	244 21.1	+28 08.1	30	19 04	20 41	20 27	21 12	21 52	22 27	32	13.4	13.8	14.3		
	2	209 32.4 26.5	20	Procyon	245 45.5	+5 20.4	20	18 42	20 06	20 09	20 59	21 43	22 23	40	13.5	13.9	14.4		
	3	224 32.2 .. 26.5					10	18 23	19 41	19 53	20 47	21 35	22 20	48	13.6	14.0	14.5		
	4	239 32.1 26.5	46	R'alhague	96 46.4	+12 35.5	0	18 05	19 20	19 39	20 36	21 28	22 17	52	13.8	14.1	14.6		
	5	254 32.0 26.5	26	Regulus	208 29.9	+12 11.1	10	17 48	19 03	19 24	20 24	21 21	22 14	60	14.0	14.3	14.7		
	6	269 31.8 +23 26.4	11	Rigel	281 54.1	-8 15.1	20	17 30	18 49	19 08	20 12	21 13	22 10	68	14.2	14.4	14.8		
	7	284 31.7 26.4	38	Rigil Kent.	140 50.8	-60 39.5	30	17 08	18 34	18 50	19 59	21 04	22 06	76	14.4	14.6	14.9		
	8	299 31.6 26.4	44	Sabik	103 02.0	-15 40.3	35	16 56	18 27	18 39	19 50	20 59	22 04	84	14.6	14.8	15.0		
	9	314 31.4 .. 26.4					40	16 41	18 19	18 27	19 41	20 53	22 01	92	14.8	15.1	15.3		
	10	329 31.3 26.4	3	Schedar	350 30.3	+56 17.4	45	16 25	18 12	18 12	19 30	20 46	21 58	100	15.3	15.3	15.4		
	11	344 31.1 26.3	45	Shaula	97 20.5	-37 04.4	50	16 04	18 04	17 54	19 17	20 37	21 54	108	15.5	15.5	15.5		
	12	359 31.0 +23 26.3	18	Sirius	259 12.4	-16 39.3	52	15 54	18 00	17 46	19 11	20 34	21 52	116	15.7	15.7	15.7		
	13	14 30.9 26.3	33	Spica	159 17.0	-10 55.9	54	15 43	17 57	17 36	19 04	20 29	21 51	124	16.0	15.9	15.8		
	14	29 30.7 26.3	23	Suhail	223 24.8	-43 15.4	56	15 30	17 52	17 26	18 56	20 24	21 48	132	16.3	16.2	16.0		
	15	44 30.6 .. 26.3					58	15 16	17 49	17 13	18 47	20 19	21 46						

G M T	VENUS -3.3		MARS 2.0		JUPITER -1.4		SATURN 0.6		MOON				
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code	
24	h	°	°	°	°	°	°	°	°	°	°	°	
	0	271 22.5	199 46.7	+21 35.3	160 49.7	+23 12.9	146 47.1	+20 11.1	48 06.1	-14 02.1	126 33.5	109 +	9 17.8 -129
	1	286 24.9	214 45.9	35.8	175 50.4	12.7	161 49.1	11.0	63 08.6	02.1	141 03.4	110	9 04.9 -129
	2	301 27.4	229 45.1	36.3	190 51.1	12.4	176 51.0	10.9	78 11.2	02.0	155 33.4	110	8 52.0 -130
	3	316 29.9	244 44.4	36.8	205 51.8	12.2	191 52.9	10.8	93 13.8	02.0	170 03.4	112	8 39.0 -131
	4	331 32.3	259 43.6	37.2	220 52.6	12.0	206 54.9	10.7	108 16.3	02.0	184 33.6	112	8 25.9 -130
	5	346 34.8	274 42.8	37.7	235 53.3	11.8	221 56.8	10.6	123 18.9	02.0	199 03.8	113	8 12.9 -131
	6	1 37.3	289 42.1	+21 38.2	250 54.0	+23 11.6	236 58.7	+20 10.5	138 21.5	-14 02.0	213 34.1	114 +	7 59.8 -131
	7	16 39.7	304 41.3	38.7	265 54.7	11.3	252 00.6	10.3	153 24.0	01.9	228 04.5	115	7 46.7 -131
	8	31 42.2	319 40.5	39.1	280 55.5	11.1	267 02.6	10.2	168 26.6	01.9	242 35.0	115	7 33.6 -131
	9	46 44.7	334 39.8	39.6	295 56.2	10.9	282 04.5	10.1	183 29.2	01.9	257 05.5	116 +	7 20.5 -131
	10	61 47.1	349 39.0	40.1	310 56.9	10.7	297 06.4	10.0	198 31.7	01.9	271 36.1	117	7 07.4 -132
	11	76 49.6	4 38.2	40.5	325 57.6	10.5	312 08.4	09.9	213 34.3	01.9	286 06.8	118	6 54.2 -132
	12	91 52.1	19 37.4	+21 41.0	340 58.4	+23 10.2	327 10.3	+20 09.8	228 36.8	-14 01.8	300 37.6	119 +	6 41.0 -132
	13	106 54.5	34 36.7	41.5	355 59.1	10.0	342 12.2	09.7	243 39.4	01.8	315 08.5	119	6 27.8 -132
	14	121 57.0	49 35.9	41.9	10 59.8	09.8	357 14.2	09.5	258 42.0	01.8	329 39.4	120	6 14.6 -132
	15	136 59.4	64 35.1	42.4	26 00.6	09.6	12 16.1	09.4	273 44.5	01.8	344 10.4	120 +	6 01.4 -133
	16	152 01.9	79 34.4	42.9	41 01.3	09.3	27 18.0	09.3	288 47.1	01.8	358 41.4	122	5 48.1 -132
	17	167 04.4	94 33.6	43.3	56 02.0	09.1	42 20.0	09.2	303 49.6	01.7	13 12.6	122	5 34.9 -133
	18	182 06.8	109 32.8	+21 43.8	71 02.7	+23 08.9	57 21.9	+20 09.1	318 52.2	-14 01.7	27 43.8	122 +	5 21.6 -132
	19	197 09.3	124 32.0	44.2	86 03.5	08.7	72 23.8	09.0	333 54.8	01.7	42 15.0	124	5 08.4 -133
	20	212 11.8	139 31.3	44.7	101 04.2	08.4	87 25.8	08.9	348 57.3	01.7	56 46.4	124	4 55.1 -133
	21	227 14.2	154 30.5	45.1	116 04.9	08.2	102 27.7	08.7	3 59.9	01.7	71 17.8	124 +	4 41.8 -132
	22	242 16.7	169 29.7	45.6	131 05.7	08.0	117 29.6	08.6	19 02.4	01.7	85 49.2	126	4 28.6 -133
23	257 19.2	184 28.9	46.1	146 06.4	07.8	132 31.6	08.5	34 05.0	01.6	100 20.8	125	4 15.3 -133	
25	0	272 21.6	199 28.2	+21 46.5	161 07.1	+23 07.5	147 33.5	+20 08.4	49 07.6	-14 01.6	114 52.3	127 +	4 02.0 -133
	1	287 24.1	214 27.4	47.0	176 07.8	07.3	162 35.4	08.3	64 10.1	01.6	129 24.0	127	3 48.7 -132
	2	302 26.5	229 26.6	47.4	191 08.6	07.1	177 37.3	08.2	79 12.7	01.6	143 55.7	128	3 35.5 -133
	3	317 29.0	244 25.8	47.9	206 09.3	06.8	192 39.3	08.1	94 15.3	01.6	158 27.5	128 +	3 22.2 -133
	4	332 31.5	259 25.0	48.3	221 10.0	06.6	207 41.2	07.9	109 17.8	01.5	172 59.3	129	3 08.9 -133
	5	347 33.9	274 24.3	48.8	236 10.8	06.4	222 43.1	07.8	124 20.4	01.5	187 31.2	129	2 55.6 -132
	6	2 36.4	289 23.5	+21 49.2	251 11.5	+23 06.2	237 45.1	+20 07.7	139 22.9	-14 01.5	202 03.1	130 +	2 42.4 -133
	7	17 38.9	304 22.7	49.7	266 12.2	05.9	252 47.0	07.6	154 25.5	01.5	216 35.1	130	2 29.1 -133
	8	32 41.3	319 21.9	50.1	281 12.9	05.7	267 48.9	07.5	169 28.0	01.5	231 07.1	131	2 15.8 -132
	9	47 43.8	334 21.2	50.5	296 13.7	05.5	282 50.9	07.4	184 30.6	01.5	245 39.2	131 +	2 02.6 -132
	10	62 46.3	349 20.4	51.0	311 14.4	05.2	297 52.8	07.2	199 33.2	01.4	260 11.3	132	1 49.4 -133
	11	77 48.7	4 19.6	51.4	326 15.1	05.0	312 54.7	07.1	214 35.7	01.4	274 43.5	133	1 36.1 -132
	12	92 51.2	19 18.8	+21 51.9	341 15.9	+23 04.8	327 56.6	+20 07.0	229 38.3	-14 01.4	289 15.8	133 +	1 22.9 -132
	13	107 53.7	34 18.0	52.3	356 16.6	04.5	342 58.6	06.9	244 40.8	01.4	303 48.1	133	1 09.7 -132
	14	122 56.1	49 17.3	52.8	11 17.3	04.3	358 00.5	06.8	259 43.4	01.4	318 20.4	134	0 56.5 -132
	15	137 58.6	64 16.5	53.2	26 18.1	04.1	13 02.4	06.7	274 46.0	01.4	332 52.8	134 +	0 43.3 -131
	16	153 01.0	79 15.7	53.6	41 18.8	03.9	28 04.4	06.6	289 48.5	01.3	347 25.2	134	0 30.2 -132
	17	168 03.5	94 14.9	54.1	56 19.5	03.6	43 06.3	06.4	304 51.1	01.3	1 57.6	135	0 17.0 -131
	18	183 06.0	109 14.1	+21 54.5	71 20.3	+23 03.4	58 08.2	+20 06.3	319 53.6	-14 01.3	16 30.1	136 +	0 03.9 -131
	19	198 08.4	124 13.3	54.9	86 21.0	03.2	73 10.2	06.2	334 56.2	01.3	31 02.7	136 -	0 09.2 -131
	20	213 10.9	139 12.6	55.4	101 21.7	02.9	88 12.1	06.1	349 58.7	01.3	45 35.3	136	0 22.3 -131
	21	228 13.4	154 11.8	55.8	116 22.4	02.7	103 14.0	06.0	5 01.3	01.2	60 07.9	136 +	0 35.4 -131
	22	243 15.8	169 11.0	56.2	131 23.2	02.5	118 15.9	05.9	20 03.9	01.2	74 40.5	137	0 48.5 -130
	23	258 18.3	184 10.2	56.7	146 23.9	02.2	133 17.9	05.7	35 06.4	01.2	89 13.2	138	1 01.5 -130
26	0	273 20.8	199 09.4	+21 57.1	161 24.6	+23 02.0	148 19.8	+20 05.6	50 09.0	-14 01.2	103 46.0	137 -	1 14.5 -130
	1	288 23.2	214 08.6	57.5	176 25.4	01.8	163 21.7	05.5	65 11.5	01.2	118 18.7	138	1 27.5 -130
	2	303 25.7	229 07.8	57.9	191 26.1	01.5	178 23.7	05.4	80 14.1	01.2	132 51.5	139	1 40.5 -129
	3	318 28.2	244 07.1	58.4	206 26.8	01.3	193 25.6	05.3	95 16.6	01.1	147 24.4	138 +	1 53.4 -130
	4	333 30.6	259 06.3	58.8	221 27.6	01.0	208 27.5	05.2	110 19.2	01.1	161 57.2	139	2 06.4 -129
	5	348 33.1	274 05.5	59.2	236 28.3	00.8	223 29.4	05.1	125 21.8	01.1	176 30.1	139	2 19.3 -128
	6	3 35.5	289 04.7	+21 59.6	251 29.0	+23 00.6	238 31.4	+20 04.9	140 24.3	-14 01.1	191 03.0	140 -	2 32.1 -129
	7	18 38.0	304 03.9	22 00.1	266 29.8	00.3	253 33.3	04.8	155 26.9	01.1	205 36.0	139	2 45.0 -128
	8	33 40.5	319 03.1	00.5	281 30.5	23 00.1	268 35.2	04.7	170 29.4	01.1	220 08.9	140	2 57.8 -128
	9	48 42.9	334 02.3	00.9	296 31.2	22 59.9	283 37.2	04.6	185 32.0	01.0	234 41.9	141 +	3 10.6 -127
	10	63 45.4	349 01.5	01.3	311 32.0	59.6	298 39.1	04.5	200 34.5	01.0	249 15.0	140	3 23.3 -127
	11	78 47.9	4 00.8	01.7	326 32.7	59.4	313 41.0	04.4	215 37.1	01.0	263 48.0	141	3 36.0 -127
	12	93 50.3	19 00.0	+22 02.1	341 33.4	+22 59.2	328 42.9	+20 04.2	230 39.6	-14 01.0	278 21.1	140 -	3 48.7 -127
	13	108 52.8	33 59.2	02.6	356 34.2	58.9	343 44.9	04.1	245 42.2	01.0	292 54.1	142	4 01.4 -126
	14	123 55.3	48 58.4	03.0	11 34.9	58.7	358 46.8	04.0	260 44.8	01.0	307 27.3	141	4 14.0 -126
	15	138 57.7	63 57.6	03.4	26 35.6	58.4	13 48.7	03.9	275 47.3	00.9	322 00.4	141	4 26.6 -126
	16	154 00.2	78 56.8	03.8	41 36.4	58.2	28 50.7	03.8	290 49.9	00.9	336 33.5	142	4 39.2 -125
	17	169 02.6	93 56.0	04.2	56 37.1	58.0	43 52.6	03.7	305 52.4	00.9	351 06.7	142	4 51.7 -125
	18	184 05.1	108 55.2	+22 04.6	71 37.8	+22 57.7	58 54.5	+20 03.5	320 55.0	-14 00.9	5 39.9	142 -	5 04.2 -124
	19	199 07.6	123 54.4	05.0	86 38.6	57.5	73 56.4	03.4	335 57.5	00.9	20 13.1	142	5 16.6 -125
	20	214 10.0	138 53.6	05.4	101 39.3	57.2	88 58.4	03.3	351 00.1	00.9	34 46.3	142	5 29.1 -123
	21	229 12.5	153 52.9	05.8	116 40.0	57.0	104 00.3	03.2	6 02.6	00.8	49 19.5	142 +	5 41.4 -124
	22	244 15.0	168 52.1	06.2	131 40.8	56.8	119 02.2	03.1	21 05.2	00.8	63 52.7	143	5 53.8 -123
	23	259 17.4	183 51.3	06.7	146 41.5	56.5	134 04.2	03.0	36 07.7	00.8	78 26.0	142	6 06.1 -122
24	274 19.9	198 50.5	+22 07.1	161 42.2	+22 56.3	149 06.1	+20 02.8	51 10.3					

G M T	SUN			STARS			Lat.	Sunrise	Twilt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS						
	GHA	Dec.	No.	Name	SHA	Dec.								Sun's Low'r Limb	Venus	Mars				
										24	25	26	27				Add	Add	Add	
h	°	'	°	°	'	°	N	h	m	h	m	h	m	h	m	Alt.	°	'	°	'
24	0	179 29.4	+23 26.0	7	Acamar	315 51.5	-40 28.7	72	□	□	8 17	10 20	12 17	14 14	Alt.	0	'	'	'	
	1	194 29.2	26.0	5	Achernar	335 59.2	-57 27.4	70	□	□	8 28	10 22	12 11	13 59		30	0.1	0.1	0.0	
	2	209 29.1	25.9	30	Acrux	173 58.0	-62 51.6	68	□	□	8 37	10 24	12 06	13 47		45	0.1	0.1	0.0	
	3	224 29.0	25.9	19	Adhara	255 47.0	-28 54.7	66	□	□	8 45	10 26	12 02	13 37		60	0.1	0.0	0.0	
	4	239 28.8	25.9	10	Aldebaran	291 39.6	+16 25.3	64	1 32	///	8 51	10 27	11 59	13 29		75	0.1	0.0	0.0	
	5	254 28.7	25.8					62	2 10	///	8 57	10 28	11 56	13 22		90				
	6	269 28.6	+23 25.8	32	Alioth	166 58.6	+56 12.2	60	2 37	///	9 01	10 29	11 54	13 16						
	7	284 28.4	25.8	34	Alkaid	153 32.8	+49 32.2	58	2 57	///	9 06	10 30	11 52	13 11						
	8	299 28.3	25.7	55	Al Na'ir	28 37.9	-47 10.3	56	3 14	///	9 09	10 31	11 50	13 06						
	9	314 28.2	25.7	15	Alnilam	276 30.8	-1 13.7	54	3 28	///	9 12	10 32	11 48	13 02						
	10	329 28.0	25.7	25	Alphard	218 39.0	-8 28.0	52	3 41	///	9 15	10 32	11 46	12 58						
	11	344 27.9	25.6					50	3 51	///	9 18	10 33	11 45	12 55						
	12	359 27.8	+23 25.6	41	Alphecca	126 47.5	+26 51.9	45	4 14	1 41	9 24	10 34	11 42	12 47						
	13	14 27.6	25.5	1	Alpheratz	358 28.5	+28 50.6	40	4 32	2 29	9 29	10 35	11 39	12 41						
	14	29 27.5	25.5	51	Altair	62 50.3	+8 45.0	35	4 47	3 00	9 33	10 36	11 37	12 36						
	15	44 27.4	25.4	2	Ankaa	353 58.5	-42 32.5	30	5 00	3 23	9 37	10 37	11 35	12 31						
	16	59 27.2	25.4	42	Antares	113 19.2	-26 20.2	20	5 22	3 58	9 43	10 39	11 32	12 24						
	17	74 27.1	25.4					10	5 41	4 23	9 49	10 40	11 29	12 17						
	18	89 27.0	+23 25.3	37	Arcturus	146 35.1	+19 24.8	0	5 59	4 44	9 54	10 41	11 26	12 10						
	19	104 26.8	25.3	43	Atria	108 59.6	-68 57.1	10	6 16	5 01	9 59	10 42	11 23	12 04						
	20	119 26.7	25.2	22	Avior	234 36.4	-59 22.2	20	6 35	5 16	10 05	10 44	11 21	11 57						
	21	134 26.5	25.2	13	Bellatrix	279 18.9	+6 18.7	30	6 56	5 30	10 11	10 45	11 17	11 49						
	22	149 26.4	25.1	16	Betelge'se	271 48.7	+7 24.0	35	7 08	5 37	10 15	10 46	11 16	11 45						
	23	164 26.3	25.1					40	7 23	5 44	10 19	10 47	11 14	11 40						
				17	Canopus	264 16.0	-52 40.3	45	7 39	5 52	10 24	10 48	11 11	11 34						
				12	Capella	281 39.1	+45 57.2	50	8 00	6 00	10 29	10 50	11 08	11 28						
				53	Deneb	50 00.7	+45 07.2	52	8 10	6 04	10 32	10 50	11 07	11 25						
				28	Denebola	183 17.9	+14 49.2	54	8 21	6 07	10 35	10 51	11 06	11 21						
				4	Diphda	349 39.5	-18 13.6	56	8 34	6 12	10 38	10 52	11 04	11 17						
								58	8 48	6 15	10 41	10 52	11 03	11 13						
								60	9 06	6 20	10 45	10 53	11 01	11 09						
								S												
				27	Dubhe	194 45.0	+61 59.7													
				14	Elnath	279 07.9	+28 34.3													
				47	Eltanin	91 05.8	+51 29.7													
				54	Enif	34 29.6	+9 40.3													
				56	Fomalhaut	16 11.7	-29 51.2													
								N	h	m	h	m	h	m	h	m				
				31	Gacrux	172 49.4	-56 52.2	72	□	□	23 10	22 49	22 28	22 05						
				29	Gienah	176 37.0	-17 17.9	70	□	□	23 04	22 51	22 37	22 22						
				35	Hadar	149 49.4	-60 09.9	68	□	□	23 00	22 52	22 44	22 35						
				6	Hamal	328 50.0	+23 15.1	66	□	□	22 56	22 53	22 50	22 46						
				48	Kaus Aust.	84 41.0	-34 24.4	64	22 32	///	22 53	22 54	22 54	22 56						
								62	21 54	///	22 50	22 54	22 59	23 04						
				40	Kochab	137 17.1	+74 20.4	60	21 28	///	22 47	22 55	23 03	23 11						
				57	Markab	14 21.5	+14 58.0	58	21 07	///	22 45	22 56	23 06	23 17						
				8	Menkar	315 00.7	+3 55.0	56	20 51	///	22 43	22 56	23 09	23 23						
				36	Menkent	148 58.7	-36 09.4	54	20 36	///	22 41	22 57	23 12	23 28						
				24	Miapl'dus	221 49.8	-69 32.3	52	20 24	///	22 39	22 57	23 14	23 32						
								50	20 13	///	22 38	22 58	23 16	23 36						
				9	Mirfak	309 43.0	+49 42.2	45	19 51	22 24	22 35	22 58	23 21	23 45						
				50	Nunki	76 51.7	-26 21.2	40	19 33	21 36	22 32	22 59	23 26	23 53						
				52	Peacock	54 27.0	-56 52.5	35	19 18	21 05	22 29	23 00	23 29	23 59						
				21	Pollux	244 21.1	+28 08.1	30	19 05	20 42	22 27	23 00	23 32	24 05						
				20	Procyon	245 45.5	+5 20.4	20	18 43	20 07	22 23	23 01	23 38	24 15						
								10	18 24	19 42	22 20	23 02	23 43	24 23						
				46	R'alhague	96 46.4	+12 35.5	0	18 06	19 21	22 17	23 03	23 47	24 31						
				26	Regulus	208 29.9	+12 11.1	10	17 49	19 04	22 14	23 04	23 52	24 39						
				11	Rigel	281 54.1	-8 15.1	20	17 30	18 49	22 10	23 04	23 57	24 48						
				38	Rigel Kent.	140 50.8	-60 39.5	30	17 09	18 35	22 06	23 05	24 02	0 02						
				44	Sabik	103 02.0	-15 40.3	35	16 57	18 28	22 04	23 06	24 05	0 05						
								40	16 42	18 20	22 01	23 06	24 09	0 09						
				3	Schedar	350 30.3	+56 17.4	45	16 26	18 13	21 58	23 07	24 13	0 13						
				45	Shaula	97 20.5	-37 04.4	50	16 05	18 05	21 54	23 08	24 19	0 19						
				18	Sirius	259 12.4	-16 39.3	52	15 55	18 01	21 52	23 08	24 21	0 21						
				33	Spica	159 17.0	-10 55.9	54	15 44	17 58	21 51	23 08	24 23	0 23						
				23	Suhail	223 24.8	-43 15.4	56	15 31	17 53	21 48	23 09	24 26	0 26						
								58	15 17	17 50	21 46	23 09	24 29	0 29						
				49	Vega	81 07.9	+38 44.5	60	14 59	17 45	21 44	23 10	24 33	0 33						
				39	Zub'g'bi	137 53.3	-15 51.6	S												
								G M T	Equation of Time (App. -Mean)			GMT of Transit Meridian of Greenwich								
									24	25	26									
								h	m	s	m	s	m	s	DAY	Moon	Venus	Mars	Jupiter	Saturn
								0	- 2 02.2	- 2 15.2	- 2 28.0				24	16 05	10 41	13 16	14 11	20 44
								6	- 2 05.5	- 2 18.4	- 2 31.2				25	16 52	10 43	13 15	14 08	20 40
								12	- 2 08.7	- 2 21.6	- 2 34.4				26	17 37	10 44	13 14	14 05	20 36
								18	- 2 11.9	- 2 24.8	- 2 37.5				27	18 21	10 45	13 13	14 02	20 32
								24	- 2 15.2	- 2 28.0	- 2 40.7									

G M T	VENUS - 3.3		MARS 2.0		JUPITER - 1.4		SATURN 0.6		MOON					
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code		
h	°	'	°	'	°	'	°	'	°	'	°	'		
27	0	274 19.9	198 50.5	+22 07.1	161 42.2	+22 56.3	149 06.1	+20 02.8	51 10.3	-14 00.8	92 59.2	143	- 6 18.3	-122
1	1	289 22.4	213 49.7	07.5	176 43.0	56.0	164 08.0	02.7	66 12.8	00.8	107 32.5	143	6 30.5	-122
2	2	304 24.8	228 48.9	07.9	191 43.7	55.8	179 09.9	02.6	81 15.4	00.8	122 05.8	143	6 42.7	-122
3	3	319 27.3	243 48.1	.. 08.3	206 44.5	.. 55.6	194 11.9	.. 02.5	96 17.9	.. 00.7	136 39.1	142	6 54.9	-120
4	4	334 29.8	258 47.3	08.7	221 45.2	55.3	209 13.8	02.4	111 20.5	00.7	151 12.3	143	7 06.9	-121
5	5	349 32.2	273 46.5	09.1	236 45.9	55.1	224 15.7	02.3	126 23.1	00.7	165 45.6	143	7 19.0	-120
6	6	4 34.7	288 45.7	+22 09.4	251 46.7	+22 54.8	239 17.6	+20 02.1	141 25.6	-14 00.7	180 18.9	143	- 7 31.0	-120
7	7	19 37.1	303 44.9	09.8	266 47.4	54.6	254 19.6	02.0	156 28.2	00.7	194 52.2	144	7 43.0	-119
8	8	34 39.6	318 44.1	10.2	281 48.1	54.3	269 21.5	01.9	171 30.7	00.7	209 25.6	143	7 54.9	-118
9	9	49 42.1	333 43.3	.. 10.6	296 48.9	.. 54.1	284 23.4	.. 01.8	186 33.3	.. 00.7	223 58.9	143	8 06.7	-119
10	10	64 44.5	348 42.5	11.0	311 49.6	53.8	299 25.4	01.7	201 35.8	00.6	238 32.2	143	8 18.6	-117
11	11	79 47.0	3 41.7	11.4	326 50.3	53.6	314 27.3	01.5	216 38.4	00.6	253 05.5	143	8 30.3	-118
12	12	94 49.5	18 40.9	+22 11.8	341 51.1	+22 53.4	329 29.2	+20 01.4	231 40.9	-14 00.6	267 38.8	143	- 8 42.1	-116
13	13	109 51.9	33 40.1	12.2	356 51.8	53.1	344 31.1	01.3	246 43.5	00.6	282 12.1	143	8 53.7	-117
14	14	124 54.4	48 39.3	12.6	11 52.6	52.9	359 33.1	01.2	261 46.0	00.6	296 45.4	143	9 05.4	-115
15	15	139 56.9	63 38.5	.. 13.0	26 53.3	.. 52.6	14 35.0	.. 01.1	276 48.6	.. 00.6	311 18.7	143	9 16.9	-116
16	16	154 59.3	78 37.7	13.4	41 54.0	52.4	29 36.9	01.0	291 51.1	00.5	325 52.0	143	9 28.5	-114
17	17	170 01.8	93 36.9	13.7	56 54.8	52.1	44 38.8	00.8	306 53.7	00.5	340 25.3	143	9 39.9	-115
18	18	185 04.3	108 36.1	+22 14.1	71 55.5	+22 51.9	59 40.8	+20 00.7	321 56.2	-14 00.5	354 58.6	143	- 9 51.4	-113
19	19	200 06.7	123 35.3	14.5	86 56.2	51.6	74 42.7	00.6	336 58.8	00.5	9 31.9	143	10 02.7	-113
20	20	215 09.2	138 34.5	14.9	101 57.0	51.4	89 44.6	00.5	352 01.3	00.5	24 05.2	143	10 14.0	-113
21	21	230 11.6	153 33.7	.. 15.3	116 57.7	.. 51.1	104 46.5	.. 00.4	7 03.9	.. 00.5	38 38.5	142	10 25.3	-112
22	22	245 14.1	168 32.9	15.6	131 58.5	50.9	119 48.5	00.3	22 06.4	00.5	53 11.7	143	10 36.5	-112
23	23	260 16.6	183 32.1	16.0	146 59.2	50.6	134 50.4	00.1	37 09.0	00.4	67 45.0	142	10 47.7	-111
28	0	275 19.0	198 31.3	+22 16.4	161 59.9	+22 50.4	149 52.3	+20 00.0	52 11.5	-14 00.4	82 18.2	143	-10 58.8	-110
1	1	290 21.5	213 30.5	16.8	177 00.7	50.1	164 54.2	19 59.9	67 14.1	00.4	96 51.5	142	11 09.8	-110
2	2	305 24.0	228 29.7	17.2	192 01.4	49.9	179 56.2	59.8	82 16.6	00.4	111 24.7	142	11 20.8	-109
3	3	320 26.4	243 28.9	.. 17.5	207 02.1	.. 49.6	194 58.1	.. 59.7	97 19.2	.. 00.4	125 57.9	142	11 31.7	-109
4	4	335 28.9	258 28.1	17.9	222 02.9	49.4	210 00.0	59.5	112 21.7	00.4	140 31.1	142	11 42.6	-108
5	5	350 31.4	273 27.3	18.3	237 03.6	49.1	225 01.9	59.4	127 24.3	00.3	155 04.3	142	11 53.4	-108
6	6	5 33.8	288 26.5	+22 18.6	252 04.4	+22 48.9	240 03.9	+19 59.3	142 26.8	-14 00.3	169 37.5	141	-12 04.2	-107
7	7	20 36.3	303 25.7	19.0	267 05.1	48.6	255 05.8	59.2	157 29.4	00.3	184 10.6	142	12 14.9	-106
8	8	35 38.7	318 24.9	19.4	282 05.8	48.4	270 07.7	59.1	172 31.9	00.3	198 43.8	141	12 25.5	-106
9	9	50 41.2	333 24.1	.. 19.8	297 06.6	.. 48.1	285 09.7	.. 59.0	187 34.5	.. 00.3	213 16.9	141	12 36.1	-105
10	10	65 43.7	348 23.3	20.1	312 07.3	47.9	300 11.6	58.8	202 37.0	00.3	227 50.0	141	12 46.6	-104
11	11	80 46.1	3 22.5	20.5	327 08.1	47.6	315 13.5	58.7	217 39.6	00.3	242 23.1	141	12 57.0	-104
12	12	95 48.6	18 21.7	+22 20.8	342 08.8	+22 47.4	330 15.4	+19 58.6	232 42.1	-14 00.2	256 56.2	140	-13 07.4	-103
13	13	110 51.1	33 20.9	21.2	357 09.5	47.1	345 17.4	58.5	247 44.7	00.2	271 29.2	140	13 17.7	-103
14	14	125 53.5	48 20.1	21.6	12 10.3	46.9	0 19.3	58.4	262 47.2	00.2	286 02.2	141	13 28.0	-102
15	15	140 56.0	63 19.3	.. 21.9	27 11.0	.. 46.6	15 21.2	.. 58.2	277 49.7	.. 00.2	300 35.3	140	13 38.2	-101
16	16	155 58.5	78 18.5	22.3	42 11.8	46.4	30 23.1	58.1	292 52.3	00.2	315 08.3	139	13 48.3	-101
17	17	171 00.9	93 17.7	22.7	57 12.5	46.1	45 25.1	58.0	307 54.8	00.2	329 41.2	140	13 58.4	-100
18	18	186 03.4	108 16.9	+22 23.0	72 13.2	+22 45.9	60 27.0	+19 57.9	322 57.4	-14 00.2	344 14.2	139	-14 08.4	-99
19	19	201 05.9	123 16.0	23.4	87 14.0	45.6	75 28.9	57.8	337 59.9	00.1	358 47.1	139	14 18.3	-98
20	20	216 08.3	138 15.2	23.7	102 14.7	45.4	90 30.8	57.7	353 02.5	00.1	13 20.0	139	14 28.1	-98
21	21	231 10.8	153 14.4	.. 24.1	117 15.5	.. 45.1	105 32.8	.. 57.5	8 05.0	.. 00.1	27 52.9	138	14 37.9	-98
22	22	246 13.2	168 13.6	24.4	132 16.2	44.9	120 34.7	57.4	23 07.6	00.1	42 25.7	139	14 47.7	-96
23	23	261 15.7	183 12.8	24.8	147 17.0	44.6	135 36.6	57.3	38 10.1	00.1	56 58.6	138	14 57.3	-96
29	0	276 18.2	198 12.0	+22 25.1	162 17.7	+22 44.3	150 38.5	+19 57.2	53 12.7	-14 00.1	71 31.4	138	-15 06.9	-95
1	1	291 20.6	213 11.2	25.5	177 18.4	44.1	165 40.5	57.1	68 15.2	00.1	86 04.2	137	15 16.4	-94
2	2	306 23.1	228 10.4	25.8	192 19.2	43.8	180 42.4	56.9	83 17.8	00.1	100 36.9	137	15 25.8	-94
3	3	321 25.6	243 09.6	.. 26.2	207 19.9	.. 43.6	195 44.3	.. 56.8	98 20.3	.. 00.0	115 09.6	137	15 35.2	-93
4	4	336 28.0	258 08.8	26.5	222 20.7	43.3	210 46.2	56.7	113 22.8	00.0	129 42.3	137	15 44.5	-92
5	5	351 30.5	273 08.0	26.9	237 21.4	43.1	225 48.1	56.6	128 25.4	00.0	144 15.0	137	15 53.7	-92
6	6	6 33.0	288 07.1	+22 27.2	252 22.1	+22 42.8	240 50.1	+19 56.5	143 27.9	-14 00.0	158 47.7	136	-16 02.9	-91
7	7	21 35.4	303 06.3	27.6	267 22.9	42.5	255 52.0	56.3	158 30.5	00.0	173 20.3	136	16 12.0	-90
8	8	36 37.9	318 05.5	27.9	282 23.6	42.3	270 53.9	56.2	173 33.0	00.0	187 52.9	135	16 21.0	-89
9	9	51 40.4	333 04.7	.. 28.2	297 24.4	.. 42.0	285 55.8	.. 56.1	188 35.6	.. 14 00.0	202 25.4	135	16 29.9	-89
10	10	66 42.8	348 03.9	28.6	312 25.1	41.8	300 57.8	56.0	203 38.1	13 59.9	216 57.9	135	16 38.8	-87
11	11	81 45.3	3 03.1	28.9	327 25.9	41.5	315 59.7	55.9	218 40.7	59.9	231 30.4	135	16 47.5	-87
12	12	96 47.7	18 02.3	+22 29.3	342 26.6	+22 41.3	331 01.6	+19 55.7	233 43.2	-13 59.9	246 02.9	135	-16 56.2	-87
13	13	111 50.2	33 01.5	29.6	357 27.3	41.0	346 03.5	55.6	248 45.7	59.9	260 35.4	134	17 04.9	-85
14	14	126 52.7	48 00.6	29.9	12 28.1	40.7	1 05.5	55.5	263 48.3	59.9	275 07.8	133	17 13.4	-85
15	15	141 55.1	62 59.8	.. 30.3	27 28.8	.. 40.5	16 07.4	.. 55.4	278 50.8	.. 59.9	289 40.1	134	17 21.9	-83
16	16	156 57.6	77 59.0	30.6	42 29.6	40.2	31 09.3	55.3	293 53.4	59.9	304 12.5	133	17 30.2	-84
17	17	172 00.1	92 58.2	30.9	57 30.3	40.0	46 11.2	55.1						

G M T	☿		♀ VENUS - 3.3		♂ MARS 2.0		♃ JUPITER - 1.4		♄ SATURN 0.6		♁ MOON			
	GHA		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
30	h	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "	° ' "
	0	277 17.3	197 52.5	+22 33.2	162 35.5	+22 38.1	151 24.7	+19 54.3	54 13.7	-13 59.8	60 30.1	130	-18 34.4	- 77
	1	292 19.8	212 51.7	33.6	177 36.3	37.9	166 26.6	54.2	69 16.3	59.8	75 02.1	130	18 42.1	- 75
	2	307 22.2	227 50.9	33.9	192 37.0	37.6	181 28.5	54.1	84 18.8	59.7	89 34.1	130	18 49.6	- 75
	3	322 24.7	242 50.0	.. 34.2	207 37.8	.. 37.3	196 30.5	.. 53.9	99 21.3	.. 59.7	104 06.1	130	18 57.1	- 74
	4	337 27.2	257 49.2	34.5	222 38.5	37.1	211 32.4	53.8	114 23.9	59.7	118 38.1	129	19 04.5	- 73
	5	352 29.6	272 48.4	34.8	237 39.3	36.8	226 34.3	53.7	129 26.4	59.7	133 10.0	128	19 11.8	- 72
	6	7 32.1	287 47.6	+22 35.2	252 40.0	+22 36.5	241 36.2	+19 53.6	144 29.0	-13 59.7	147 41.8	129	-19 19.0	- 72
	7	22 34.6	302 46.8	35.5	267 40.8	36.3	256 38.2	53.5	159 31.5	59.7	162 13.7	128	19 26.2	- 70
	8	37 37.0	317 46.0	35.8	282 41.5	36.0	271 40.1	53.3	174 34.0	59.7	176 45.5	128	19 33.2	- 70
	9	52 39.5	332 45.1	.. 36.1	297 42.2	.. 35.7	286 42.0	.. 53.2	189 36.6	.. 59.7	191 17.3	127	19 40.2	- 68
	10	67 42.0	347 44.3	36.4	312 43.0	35.5	301 43.9	53.1	204 39.1	59.6	205 49.0	127	19 47.0	- 68
	11	82 44.4	2 43.5	36.7	327 43.7	35.2	316 45.8	53.0	219 41.7	59.6	220 20.7	127	19 53.8	- 67
	12	97 46.9	17 42.7	+22 37.0	342 44.5	+22 34.9	331 47.8	+19 52.9	234 44.2	-13 59.6	234 52.4	126	-20 00.5	- 66
	13	112 49.3	32 41.9	37.3	357 45.2	34.7	346 49.7	52.7	249 46.8	59.6	249 24.0	126	20 07.1	- 65
	14	127 51.8	47 41.0	37.7	12 46.0	34.4	1 51.6	52.6	264 49.3	59.6	263 55.6	126	20 13.6	- 64
	15	142 54.3	62 40.2	.. 38.0	27 46.7	.. 34.1	16 53.5	.. 52.5	279 51.8	.. 59.6	278 27.2	125	20 20.0	- 63
	16	157 56.7	77 39.4	38.3	42 47.5	33.9	31 55.5	52.4	294 54.4	59.6	292 58.7	125	20 26.3	- 63
	17	172 59.2	92 38.6	38.6	57 48.2	33.6	46 57.4	52.3	309 56.9	59.6	307 30.2	125	20 32.6	- 61
	18	188 01.7	107 37.8	+22 38.9	72 49.0	+22 33.3	61 59.3	+19 52.1	324 59.5	-13 59.5	322 01.7	124	-20 38.7	- 61
	19	203 04.1	122 36.9	39.2	87 49.7	33.1	77 01.2	52.0	340 02.0	59.5	336 33.1	124	20 44.8	- 59
	20	218 06.6	137 36.1	39.5	102 50.5	32.8	92 03.1	51.9	355 04.5	59.5	351 04.5	123	20 50.7	- 59
	21	233 09.1	152 35.3	.. 39.8	117 51.2	.. 32.5	107 05.1	.. 51.8	10 07.1	.. 59.5	5 35.8	124	20 56.6	- 57
	22	248 11.5	167 34.5	40.1	132 52.0	32.3	122 07.0	51.7	25 09.6	59.5	20 07.2	123	21 02.3	- 57
	23	263 14.0	182 33.6	40.4	147 52.7	32.0	137 08.9	51.5	40 12.1	59.5	34 38.5	122	21 08.0	- 55
10	0	278 16.5	197 32.8	+22 40.7	162 53.5	+22 31.7	152 10.8	+19 51.4	55 14.7	-13 59.5	49 09.7	122	-21 13.5	- 55
	1	293 18.9	212 32.0	41.0	177 54.2	31.5	167 12.8	51.3	70 17.2	59.5	63 40.9	122	21 19.0	- 54
	2	308 21.4	227 31.2	41.3	192 55.0	31.2	182 14.7	51.2	85 19.8	59.5	78 12.1	122	21 24.4	- 53
	3	323 23.8	242 30.4	.. 41.6	207 55.7	.. 30.9	197 16.6	.. 51.1	100 22.3	.. 59.4	92 43.3	121	21 29.7	- 51
	4	338 26.3	257 29.5	41.9	222 56.4	30.7	212 18.5	50.9	115 24.8	59.4	107 14.4	121	21 34.8	- 51
	5	353 28.8	272 28.7	42.2	237 57.2	30.4	227 20.4	50.8	130 27.4	59.4	121 45.5	121	21 39.9	- 50
	6	8 31.2	287 27.9	+22 42.5	252 57.9	+22 30.1	242 22.4	+19 50.7	145 29.9	-13 59.4	136 16.6	120	-21 44.9	- 49
	7	23 33.7	302 27.1	42.7	267 58.7	29.8	257 24.3	50.6	160 32.5	59.4	150 47.6	120	21 49.8	- 48
	8	38 36.2	317 26.2	43.0	282 59.4	29.6	272 26.2	50.4	175 35.0	59.4	165 18.6	119	21 54.6	- 46
	9	53 38.6	332 25.4	.. 43.3	298 00.2	.. 29.3	287 28.1	.. 50.3	190 37.5	.. 59.4	179 49.5	120	21 59.2	- 46
	10	68 41.1	347 24.6	43.6	313 00.9	29.0	302 30.0	50.2	205 40.1	59.4	194 20.5	119	22 03.8	- 45
	11	83 43.6	2 23.8	43.9	328 01.7	28.7	317 32.0	50.1	220 42.6	59.4	208 51.4	118	22 08.3	- 44
	12	98 46.0	17 22.9	+22 44.2	343 02.4	+22 28.5	332 33.9	+19 50.0	235 45.1	-13 59.3	223 22.2	119	-22 12.7	- 43
	13	113 48.5	32 22.1	44.5	358 03.2	28.2	347 35.8	49.8	250 47.7	59.3	237 53.1	118	22 17.0	- 41
	14	128 51.0	47 21.3	44.7	13 03.9	27.9	2 37.7	49.7	265 50.2	59.3	252 23.9	118	22 21.1	- 41
	15	143 53.4	62 20.4	.. 45.0	28 04.7	.. 27.7	17 39.7	.. 49.6	280 52.8	.. 59.3	266 54.7	117	22 25.2	- 40
	16	158 55.9	77 19.6	45.3	43 05.4	27.4	32 41.6	49.5	295 55.3	59.3	281 25.4	118	22 29.2	- 38
	17	173 58.3	92 18.8	45.6	58 06.2	27.1	47 43.5	49.4	310 57.8	59.3	295 56.2	117	22 33.0	- 38
	18	189 00.8	107 18.0	+22 45.9	73 07.0	+22 26.8	62 45.4	+19 49.2	326 00.4	-13 59.3	310 26.9	116	-22 36.8	- 37
	19	204 03.3	122 17.1	46.1	88 07.7	26.6	77 47.3	49.1	341 02.9	59.3	324 57.5	117	22 40.5	- 35
	20	219 05.7	137 16.3	46.4	103 08.5	26.3	92 49.3	49.0	356 05.4	59.3	339 28.2	116	22 44.0	- 35
	21	234 08.2	152 15.5	.. 46.7	118 09.2	.. 26.0	107 51.2	.. 48.9	11 08.0	.. 59.2	353 58.8	116	22 47.5	- 33
	22	249 10.7	167 14.7	47.0	133 10.0	25.7	122 53.1	48.7	26 10.5	59.2	8 29.4	115	22 50.8	- 32
	23	264 13.1	182 13.8	47.2	148 10.7	25.5	137 55.0	48.6	41 13.0	59.2	22 59.9	116	22 54.0	- 32
20	0	279 15.6	197 13.0	+22 47.5	163 11.5	+22 25.2	152 56.9	+19 48.5	56 15.6	-13 59.2	37 30.5	115	-22 57.2	- 30
	1	294 18.1	212 12.2	47.8	178 12.2	24.9	167 58.9	48.4	71 18.1	59.2	52 01.0	115	23 00.2	- 29
	2	309 20.5	227 11.3	48.0	193 13.0	24.6	183 00.8	48.3	86 20.6	59.2	66 31.5	114	23 03.1	- 28
	3	324 23.0	242 10.5	.. 48.3	208 13.7	.. 24.3	198 02.7	.. 48.1	101 23.2	.. 59.2	81 01.9	115	23 05.9	- 27
	4	339 25.4	257 09.7	48.6	223 14.5	24.1	213 04.6	48.0	116 25.7	59.2	95 32.4	114	23 08.6	- 26
	5	354 27.9	272 08.8	48.8	238 15.2	23.8	228 06.5	47.9	131 28.2	59.2	110 02.8	114	23 11.2	- 25
	6	9 30.4	287 08.0	+22 49.1	253 16.0	+22 23.5	243 08.5	+19 47.8	146 30.8	-13 59.2	124 33.2	113	-23 13.7	- 24
	7	24 32.8	302 07.2	49.4	268 16.7	23.2	258 10.4	47.7	161 33.3	59.1	139 03.5	114	23 16.1	- 22
	8	39 35.3	317 06.3	49.6	283 17.5	23.0	273 12.3	47.5	176 35.8	59.1	153 33.9	113	23 18.3	- 22
	9	54 37.8	332 05.5	.. 49.9	298 18.2	.. 22.7	288 14.2	.. 47.4	191 38.4	.. 59.1	168 04.2	114	23 20.5	- 20
	10	69 40.2	347 04.7	50.1	313 19.0	22.4	303 16.1	47.3	206 40.9	59.1	182 34.6	112	23 22.5	- 20
	11	84 42.7	2 03.9	50.4	328 19.7	22.1	318 18.1	47.2	221 43.4	59.1	197 04.8	113	23 24.5	- 18
	12	99 45.2	17 03.0	+22 50.7	343 20.5	+22 21.8	333 20.0	+19 47.0	236 46.0	-13 59.1	211 35.1	113	-23 26.3	- 17
	13	114 47.6	32 02.2	50.9	358 21.2	21.6	348 21.9	46.9	251 48.5	59.1	226 05.4	112	23 28.0	- 16
	14	129 50.1	47 01.4	51.2	13 22.0	21.3	3 23.8	46.8	266 51.0	59.1	240 35.6	113	23 29.6	- 15
	15	144 52.6	62 00.5	.. 51.4	28 22.8	.. 21.0	18 25.7	.. 46.7	281 53.6	.. 59.1	255 05.9	112	23 31.1	- 14
	16	159 55.0	76 59.7	51.7	43 23.5	20.7	33 27.7	46.6	296 56.1	59.1	269 36.1	112	23 32.5	- 13
	17	174 57.5	91 58.9	51.9	58 24.3	20.4	48 29.6	46.4	311 58.6	59.0	284 06.3	111	23 33.8	- 12
	18	189 59.9	106 58.0	+22 52.2	73 25.0	+22 20.1	63 31.5	+19 46.3	327 01.2	-13 59.0	298 36.4	112	-23 35.0	- 11
	19	205 02.4	121 57.2	52.4	88 25.8	19.9	78 33.4	46.2	342 03.7	59.0	313 06.6	112	23 36.1	- 9
	20	220 04.9	136 56.4	52.7	103 26.5	19.6	93 35.3	46.1	357 06.2	59.0	327 36.8	111	23 37.0	- 8
	21	235 07.3	151 55.5	.. 52.9	118 27.3	.. 19.3	108 37.3	.. 45.9	12 08.8	.. 59.0	342 06.9	111	23 37.8	- 8
	22	250 09.8	166 54											

G M T	SUN			STARS			Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.	No.	Name	SHA	Dec.													
										30	1	2	3	Alt.	Sun's Low'r Limb	Venus	Mars		
h	°	'			°	'	N	h	m	h	m	h	m	h	m	°	'	'	'
30	0	179 10.5	+23 14.1	7	Acamar	315 51.5	-40 28.7	72	□	□	■	■	■	■	■	Alt.			
	1	194 10.4	14.0	5	Achernar	335 59.1	-57 27.4	70	□	□	■	■	■	■	■	Add			
	2	209 10.3	13.8	30	Acruz	173 58.0	-62 51.6	68	□	□	19 17	20 07	21 36	22 10	0	0.1	0.1	0.1	
	3	224 10.1	13.7	19	Adhara	255 47.0	-28 54.7	66	□	□	18 27	20 07	21 36	22 10	30	0.1	0.1	0.0	
	4	239 10.0	13.6	10	Aldebaran	291 39.5	+16 25.3	64	1 40	///	17 55	19 19	20 28	21 12	45	0.1	0.1	0.0	
	5	254 09.9	13.4					62	2 16	///	17 32	18 48	19 52	20 38	60	0.1	0.0	0.0	
	6	269 09.8	+23 13.3	32	Alioth	166 58.6	+56 12.3	60	2 41	///	17 14	18 25	19 27	20 14	75	0.1	0.0	0.0	
	7	284 09.6	13.1	34	Alkaid	153 32.8	+49 32.3	58	3 01	///	16 58	18 07	19 07	19 54	90	0.1	0.0	0.0	
	8	299 09.5	13.0	55	Al Na'ir	28 37.8	-47 10.3	56	3 18	///	16 45	17 51	18 50	19 38					
	9	314 09.4	12.9	15	Alnilam	276 30.8	-1 13.7	54	3 31	///	16 34	17 38	18 35	19 24					
	10	329 09.3	12.7	25	Alphard	218 39.0	-8 28.0	52	3 44	///	16 24	17 27	18 23	19 12					
	11	344 09.1	12.6					50	3 54	///	16 15	17 16	18 12	19 01					
	12	359 09.0	+23 12.4	41	Alphecca	126 47.5	+26 51.9	45	4 17	1 45	15 56	16 55	17 49	18 38	Moon's Lower Limb				
	13	14 08.9	12.3	1	Alpheratz	358 28.5	+28 50.7	40	4 34	2 32	15 41	16 38	17 31	18 20	Add				
	14	29 08.8	12.2	51	Altair	62 50.2	+8 45.0	35	4 49	3 02	15 28	16 23	17 16	18 05	Alt.	30	1	2	
	15	44 08.6	12.0	2	Ankaa	353 58.4	-42 32.5	30	5 02	3 26	15 17	16 11	17 02	17 52	°	'	'	'	
	16	59 08.5	11.9	42	Antares	113 19.2	-26 20.2	20	5 24	4 00	14 58	15 49	16 40	17 29	0	12.0	11.9	11.7	
	17	74 08.4	11.7					10	5 43	4 24	14 41	15 30	16 20	17 10	4	12.0	11.9	11.7	
	18	89 08.3	+23 11.6	37	Arcturus	146 35.2	+19 24.8	0	6 00	4 45	14 26	15 13	16 02	16 52	8	12.0	11.9	11.8	
	19	104 08.1	11.4	43	Atria	108 59.6	-68 57.1	10	6 17	5 02	14 10	14 56	15 44	16 33	12	12.1	11.9	11.8	
	20	119 08.0	11.3	22	Avior	234 36.4	-59 22.1	20	6 36	5 16	13 54	14 38	15 24	16 14	16	12.1	12.0	11.9	
	21	134 07.9	11.1	13	Bellatrix	279 18.9	+6 18.7	30	6 56	5 31	13 35	14 16	15 02	15 51	20	12.2	12.1	12.0	
	22	149 07.8	11.0	16	Betelge'se	271 48.6	+7 24.0	35	7 09	5 38	13 24	14 04	14 49	15 38	24	12.3	12.2	12.0	
	23	164 07.7	10.8					40	7 23	5 44	13 12	13 50	14 34	15 23	28	12.4	12.2	12.1	
	1	0	179 07.5	+23 10.7	17	Canopus	264 16.0	-52 40.2	45	7 39	5 52	12 57	13 33	14 16	15 05	32	12.5	12.4	12.2
		1	194 07.4	10.5	53	Deneb	50 00.7	+45 07.2	52	8 09	6 04	12 31	13 03	13 43	14 32	36	12.6	12.5	12.4
		2	209 07.3	10.4	28	Denebola	183 18.0	+14 49.2	54	8 20	6 08	12 21	12 52	13 31	14 19	40	12.7	12.6	12.5
		3	224 07.2	10.2	4	Diphda	349 39.4	-18 13.6	56	8 33	6 11	12 11	12 39	13 17	14 05	44	12.8	12.7	12.6
		4	239 07.0	10.1					58	8 47	6 16	11 59	12 25	13 01	13 49	48	13.0	12.9	12.8
		5	254 06.9	09.9	27	Dubhe	194 45.0	+61 59.7	60	9 04	6 20	11 45	12 08	12 41	13 29	52	13.1	13.1	13.0
		6	269 06.8	+23 09.8	14	Elnath	279 07.9	+28 34.3								56	13.3	13.2	13.1
		7	284 06.7	09.6	47	Eltanin	91 05.8	+51 29.7								60	13.5	13.4	13.3
		8	299 06.5	09.5	54	Enif	34 29.5	+9 40.3								64	13.6	13.6	13.5
		9	314 06.4	09.3	56	Fomalhaut	16 11.6	-29 51.2								68	13.8	13.8	13.7
	10	329 06.3	09.1												72	14.0	14.0	13.9	
	11	344 06.2	09.0	31	Gacrux	172 49.4	-56 52.2	72	□	□	■	■	■	■	76	14.2	14.2	14.1	
	12	359 06.1	+23 08.8	29	Gienah	176 37.1	-17 17.9	70	□	□	■	■	■	■	80	14.4	14.4	14.3	
	13	14 05.9	08.7	35	Hadar	149 49.4	-60 09.9	68	□	□	21 48	22 38	23 21	24 00	84	14.6	14.6	14.5	
	14	29 05.8	08.5	6	Hamal	328 50.0	+23 15.2	66	23 47	///	22 39	22 38	22 51	24 00	88	14.7	14.7	14.7	
	15	44 05.7	08.3	48	Kaus Aust.	84 41.0	-34 24.4	64	22 26	///	23 10	23 26	24 00	0 00	Add to table, back cover				
	16	59 05.6	08.2					62	21 51	///	23 34	23 57	24 35	0 35	Moon's Upper Limb				
	17	74 05.5	08.0	40	Kochab	137 17.2	+74 20.5	60	21 25	///	23 53	24 20	0 20	1 01	Subtract				
	18	89 05.3	+23 07.9	57	Markab	14 21.5	+14 58.0	58	21 06	///	24 09	0 09	0 39	1 21	Alt.	30	1	2	
	19	104 05.2	07.7	8	Menkar	315 00.7	+3 55.1	56	20 49	///	24 22	0 22	0 55	1 38	°	'	'	'	
	20	119 05.1	07.5	36	Menkent	148 58.7	-36 09.4	54	20 35	///	0 07	0 34	1 08	1 52	4	17.6	17.7	17.7	
	21	134 05.0	07.4	24	Miap'dus	221 49.8	-69 32.3	52	20 23	///	0 16	0 44	1 20	2 04	8	17.5	17.6	17.6	
	22	149 04.9	07.2					50	20 13	///	0 23	0 54	1 30	2 15	12	17.5	17.5	17.6	
	23	164 04.7	07.0	9	Mirfak	309 43.0	+49 42.2	45	19 51	22 22	0 40	1 13	1 52	2 38	16	17.5	17.5	17.6	
	2	0	179 04.6	+23 06.9	50	Nunki	76 51.7	-26 21.2	40	19 33	21 35	0 53	1 29	2 10	2 56	20	17.4	17.5	17.5
		1	194 04.5	06.7	52	Peacock	54 27.0	-56 52.6	35	19 18	21 04	1 05	1 42	2 25	3 12	24	17.3	17.4	17.4
		2	209 04.4	06.5	21	Pollux	244 21.1	+28 08.1	30	19 05	20 41	1 15	1 54	2 38	3 25	28	17.2	17.3	17.3
		3	224 04.3	06.4	20	Procyon	245 45.5	+5 20.4	20	18 43	20 07	1 32	2 14	3 00	3 48	32	17.1	17.2	17.2
		4	239 04.1	06.2					10	18 25	19 43	1 47	2 32	3 19	4 08	36	17.0	17.0	17.1
		5	254 04.0	06.0	46	R'alhague	96 46.4	+12 35.5	0	18 07	19 22	2 01	2 48	3 37	4 26	40	16.9	16.9	17.0
		6	269 03.9	+23 05.9	26	Regulus	208 29.9	+12 11.1	10	17 50	19 05	2 16	3 05	3 55	4 44	44	16.7	16.8	16.8
		7	284 03.8	05.7	11	Rigel	281 54.1	-8 15.1	20	17 32	18 51	2 31	3 22	4 14	5 04	48	16.6	16.6	16.7
		8	299 03.7	05.5	38	Rigel Kent.	140 50.9	-60 39.5	30	17 11	18 36	2 48	3 43	4 36	5 27	52	16.4	16.5	16.5
		9	314 03.5	05.3	44	Sabik	103 02.0	-15 40.3	35	16 59	18 30	2 59	3 55	4 49	5 40	56	16.3	16.3	16.3
	10	329 03.4	05.2					40	16 45	18 22	3 10	4 08	5 04	5 55	60	16.1	16.1	16.1	
	11	344 03.3	05.0	3	Schedar	350 30.2	+56 17.5	45	16 28	18 14	3 24	4 25	5 21	6 13	64	15.9	15.9	16.0	
	12	359 03.2	+23 04.8	45	Shaula	97 20.5	-37 04.4	50	16 08	18 07	3 41	4 45	5 43	6 36	68	15.7	15.8	15.8	
	13	359 03.2	+23 04.8	18	Sirius	259 12.3	-16 39.2	52	15 58	18 03	3 49	4 54	5 54	6 47	72	15.6	15.6	15.6	
	14	14 03.1	04.6	33	Spica	159 17.0	-10 55.9	54	15 47	18 00	3 58	5 05	6 06	6 59	76	15.4	15.4	15.4	
	15	29 02.9	04.5	23	Suhail	223 24.8	-43 15.3	56	15 35	17 57	4 08	5 17	6 20	7 13	80	15.2	15.2	15.2	
	16	44 02.8	04.3					58	15 21	17 53	4 20	5 31	6 36	7 30	84	15.0	15.0	14.9	
	17	59 02.7	04.1	49	Vega	81 07.9	+38 44.5	60	15 04	17 49	4 33	5 48	6 55	7 49	88	14.8	14.8	14.8	
	18	74 02.6	03.9	39	Zub'g'bi	137 53.3	-15 51.6								90				
	19	0	179 02.5	+23 03.7	G M T	Equation of Time (App.—Mean)			GMT of Transit Meridian of Greenwich										
		1	194 02.4	03.6	T	30													

G M T	☿		VENUS - 3.3		MARS 2.0		JUPITER - 1.3		SATURN 0.6		MOON		
	GHA		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec. code
3 0	280 14.7		196 53.0	+22 53.7	163 29.5	+22 18.5	153 43.0	+19 45.6	57 16.4	-13 59.0	25 37.3	111	-23 39.7 - 4
1	295 17.2		211 52.2	53.9	178 30.3	18.2	168 44.9	45.4	72 18.9	59.0	40 07.4	111	23 40.1 - 2
2	310 19.7		226 51.3	54.1	193 31.1	17.9	183 46.9	45.3	87 21.4	59.0	54 37.5	111	23 40.3 - 2
3	325 22.1		241 50.5	.. 54.4	208 31.8	.. 17.6	198 48.8	.. 45.2	102 24.0	.. 59.0	69 07.6	110	.. 23 40.5 - 1
4	340 24.6		256 49.7	54.6	223 32.6	17.3	213 50.7	45.1	117 26.5	58.9	83 37.6	111	23 40.6 + 1
5	355 27.1		271 48.8	54.9	238 33.3	17.0	228 52.6	45.0	132 29.0	58.9	98 07.7	111	23 40.5 + 2
6	10 29.5		286 48.0	+22 55.1	253 34.1	+22 16.7	243 54.5	+19 44.8	147 31.5	-13 58.9	112 37.8	110	-23 40.3 + 2
7	25 32.0		301 47.2	55.3	268 34.8	16.5	258 56.5	44.7	162 34.1	58.9	127 07.8	111	23 40.1 + 4
8	40 34.4		316 46.3	55.6	283 35.6	16.2	273 58.4	44.6	177 36.6	58.9	141 37.9	111	23 39.7 + 5
9	55 36.9		331 45.5	.. 55.8	298 36.3	.. 15.9	289 00.3	.. 44.5	192 39.1	.. 58.9	156 08.0	110	.. 23 39.2 + 7
10	70 39.4		346 44.6	56.0	313 37.1	15.6	304 02.2	44.3	207 41.7	58.9	170 38.0	111	23 38.5 + 7
11	85 41.8		1 43.8	56.3	328 37.9	15.3	319 04.1	44.2	222 44.2	58.9	185 08.1	110	23 37.8 + 8
12	100 44.3		16 43.0	+22 56.5	343 38.6	+22 15.0	334 06.0	+19 44.1	237 46.7	-13 58.9	199 38.1	111	-23 37.0 + 10
13	115 46.8		31 42.1	56.7	358 39.4	14.7	349 08.0	44.0	252 49.3	58.9	214 08.2	110	23 36.0 + 11
14	130 49.2		46 41.3	57.0	13 40.1	14.5	4 09.9	43.8	267 51.8	58.9	228 38.2	111	23 34.9 + 11
15	145 51.7		61 40.5	.. 57.2	28 40.9	.. 14.2	19 11.8	.. 43.7	282 54.3	.. 58.8	243 08.3	110	.. 23 33.8 + 13
16	160 54.2		76 39.6	57.4	43 41.6	13.9	34 13.7	43.6	297 56.8	58.8	257 38.3	111	23 32.5 + 14
17	175 56.6		91 38.8	57.6	58 42.4	13.6	49 15.6	43.5	312 59.4	58.8	272 08.4	111	23 31.1 + 15
18	190 59.1		106 37.9	+22 57.9	73 43.2	+22 13.3	64 17.6	+19 43.4	328 01.9	-13 58.8	286 38.5	110	-23 29.6 + 17
19	206 01.6		121 37.1	58.1	88 43.9	13.0	79 19.5	43.2	343 04.4	58.8	301 08.5	111	23 27.9 + 17
20	221 04.0		136 36.3	58.3	103 44.7	12.7	94 21.4	43.1	358 07.0	58.8	315 38.6	111	23 26.2 + 19
21	236 06.5		151 35.4	.. 58.5	118 45.4	.. 12.4	109 23.3	.. 43.0	13 09.5	.. 58.8	330 08.7	111	.. 23 24.3 + 19
22	251 08.9		166 34.6	58.7	133 46.2	12.1	124 25.2	42.9	28 12.0	58.8	344 38.8	110	23 22.4 + 21
23	266 11.4		181 33.7	59.0	148 47.0	11.9	139 27.1	42.7	43 14.5	58.8	359 08.8	111	23 20.3 + 22
4 0	281 13.9		196 32.9	+22 59.2	163 47.7	+22 11.6	154 29.1	+19 42.6	58 17.1	-13 58.8	13 38.9	111	-23 18.1 + 23
1	296 16.3		211 32.1	59.4	178 48.5	11.3	169 31.0	42.5	73 19.6	58.8	28 09.0	112	23 15.8 + 24
2	311 18.8		226 31.2	59.6	193 49.2	11.0	184 32.9	42.4	88 22.1	58.8	42 39.2	111	23 13.4 + 25
3	326 21.3		241 30.4	+22 59.8	208 50.0	.. 10.7	199 34.8	.. 42.2	103 24.6	.. 58.8	57 09.3	111	.. 23 10.9 + 26
4	341 23.7		256 29.5	23 00.0	223 50.8	10.4	214 36.7	42.1	118 27.2	58.7	71 39.4	112	23 08.3 + 28
5	356 26.2		271 28.7	00.2	238 51.5	10.1	229 38.7	42.0	133 29.7	58.7	86 09.6	111	23 05.5 + 28
6	11 28.7		286 27.8	+23 00.5	253 52.3	+22 09.8	244 40.6	+19 41.9	148 32.2	-13 58.7	100 39.7	112	-23 02.7 + 30
7	26 31.1		301 27.0	00.7	268 53.0	09.5	259 42.5	41.7	163 34.8	58.7	115 09.9	112	22 59.7 + 31
8	41 33.6		316 26.2	00.9	283 53.8	09.2	274 44.4	41.6	178 37.3	58.7	129 40.1	112	22 56.6 + 32
9	56 36.0		331 25.3	.. 01.1	298 54.5	.. 08.9	289 46.3	.. 41.5	193 39.8	.. 58.7	144 10.3	112	.. 22 53.4 + 32
10	71 38.5		346 24.5	01.3	313 55.3	08.7	304 48.2	41.4	208 42.3	58.7	158 40.5	113	22 50.2 + 34
11	86 41.0		1 23.6	01.5	328 56.1	08.4	319 50.2	41.2	223 44.9	58.7	173 10.8	112	22 46.8 + 35
12	101 43.4		16 22.8	+23 01.7	343 56.8	+22 08.1	334 52.1	+19 41.1	238 47.4	-13 58.7	187 41.0	113	-22 43.3 + 37
13	116 45.9		31 21.9	01.9	358 57.6	07.8	349 54.0	41.0	253 49.9	58.7	202 11.3	113	22 39.6 + 37
14	131 48.4		46 21.1	02.1	13 58.4	07.5	4 55.9	40.9	268 52.4	58.7	216 41.6	113	22 35.9 + 38
15	146 50.8		61 20.3	.. 02.3	28 59.1	.. 07.2	19 57.8	.. 40.7	283 55.0	.. 58.7	231 11.9	113	.. 22 32.1 + 40
16	161 53.3		76 19.4	02.5	43 59.9	06.9	34 59.8	40.6	298 57.5	58.7	245 42.2	113	22 28.1 + 40
17	176 55.8		91 18.6	02.7	59 00.6	06.6	50 01.7	40.5	314 00.0	58.6	260 12.5	114	22 24.1 + 42
18	191 58.2		106 17.7	+23 02.9	74 01.4	+22 06.3	65 03.6	+19 40.4	329 02.5	-13 58.6	274 42.9	114	-22 19.9 + 42
19	207 00.7		121 16.9	03.1	89 02.2	06.0	80 05.5	40.2	344 05.1	58.6	289 13.3	114	22 15.7 + 44
20	222 03.2		136 16.0	03.3	104 02.9	05.7	95 07.4	40.1	359 07.6	58.6	303 43.7	114	22 11.3 + 45
21	237 05.6		151 15.2	.. 03.5	119 03.7	.. 05.4	110 09.3	.. 40.0	14 10.1	.. 58.6	318 14.1	115	.. 22 06.8 + 45
22	252 08.1		166 14.3	03.6	134 04.4	05.1	125 11.3	39.9	29 12.6	58.6	332 44.6	114	22 02.3 + 47
23	267 10.5		181 13.5	03.8	149 05.2	04.8	140 13.2	39.8	44 15.2	58.6	347 15.0	115	21 57.6 + 48
5 0	282 13.0		196 12.7	+23 04.0	164 06.0	+22 04.5	155 15.1	+19 39.6	59 17.7	-13 58.6	1 45.5	115	-21 52.8 + 49
1	297 15.5		211 11.8	04.2	179 06.7	04.2	170 17.0	39.5	74 20.2	58.6	16 16.0	116	21 47.9 + 50
2	312 17.9		226 11.0	04.4	194 07.5	03.9	185 18.9	39.4	89 22.7	58.6	30 46.6	116	21 42.9 + 51
3	327 20.4		241 10.1	.. 04.6	209 08.3	.. 03.6	200 20.8	.. 39.3	104 25.2	.. 58.6	45 17.2	115	.. 21 37.8 + 52
4	342 22.9		256 09.3	04.8	224 09.0	03.3	215 22.8	39.1	119 27.8	58.6	59 47.7	117	21 32.6 + 53
5	357 25.3		271 08.4	05.0	239 09.8	03.0	230 24.7	39.0	134 30.3	58.6	74 18.4	116	21 27.3 + 54
6	12 27.8		286 07.6	+23 05.1	254 10.5	+22 02.7	245 26.6	+19 38.9	149 32.8	-13 58.6	88 49.0	117	-21 21.9 + 55
7	27 30.3		301 06.7	05.3	269 11.3	02.4	260 28.5	38.8	164 35.3	58.6	103 19.7	117	21 16.4 + 57
8	42 32.7		316 05.9	05.5	284 12.1	02.1	275 30.4	38.6	179 37.9	58.5	117 50.4	117	21 10.7 + 57
9	57 35.2		331 05.0	.. 05.7	299 12.8	.. 01.8	290 32.3	.. 38.5	194 40.4	.. 58.5	132 21.1	118	.. 21 05.0 + 58
10	72 37.7		346 04.2	05.9	314 13.6	01.5	305 34.3	38.4	209 42.9	58.5	146 51.9	117	20 59.2 + 59
11	87 40.1		1 03.3	06.0	329 14.4	01.2	320 36.2	38.3	224 45.4	58.5	161 22.6	119	20 53.3 + 60
12	102 42.6		16 02.5	+23 06.2	344 15.1	+22 00.9	335 38.1	+19 38.1	239 47.9	-13 58.5	175 53.5	118	-20 47.3 + 61
13	117 45.0		31 01.6	06.4	359 15.9	00.6	350 40.0	38.0	254 50.5	58.5	190 24.3	119	20 41.2 + 62
14	132 47.5		46 00.8	06.6	14 16.6	00.3	5 41.9	37.9	269 53.0	58.5	204 55.2	119	20 35.0 + 64
15	147 50.0		60 59.9	.. 06.7	29 17.4	.. 22 00.0	20 43.8	.. 37.7	284 55.5	.. 58.5	219 26.1	119	.. 20 28.6 + 64
16	162 52.4		75 59.1	06.9	44 18.2	21 59.7	35 45.8	37.6	299 58.0	58.5	233 57.0	119	20 22.2 + 65
17	177 54.9		90 58.3	07.1	59 18.9	59.4	50 47.7	37.5	315 00.6	58.5	248 27.9	120	20 15.7 + 66
18	192 57.4		105 57.4	+23 07.2	74 19.7	+21 59.1	65 49.6	+19 37.4	330 03.1	-13 58.5	262 58.9	121	-20 09.1 + 67
19	207 59.8		120 56.6	07.4	89 20.5	58.8	80 51.5	37.2	345 05.6	58.5	277 30.0	120	20 02.4 + 68
20	223 02.3		135 55.7	07.6	104 21.2	58.5	95 53.4	37.1	0 08.1	58.5	292 01.0	121	19 55.6 + 68
21	238 04.8		150 54.9	.. 07.7	119 22.0	.. 58.2	110 55.3	.. 37.0	15 10.6	.. 58.5	306 32.1	121	.. 19 48.8 + 70
22	253 07.2		165 54.0	07.9	134 22.8	57.9	125 57.2	36.9	30 13.2	58.5	321 03.2	121	19 41.8 + 71
23	268 09.7		180 53.2	08.1	149 23.5	57.6	140 59.2	36.7	45 15.7	58.5	335 34.3	122	19 34.7 + 72
24	283 12.2		195 52.3	+23 08.2	164 24.3	+21 57.3	156 01.1	+19 36.6	60 18.2	-13 58.4	350 05.5	122	-19 27.5 + 72
code	-		- 9	+ 2	+ 8	- 3	+ 19	- 1	+ 25	0			

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS			
	GHA	Dec.	No.	Name	SHA	Dec.				3	4	5	6				
	h °	°		°	°	°				h m	h m	h m	h m	Alt.	Sun's Low'r Limb Add	Venus Add	Mars Add
30	179 01.8	+23 02.6	7	Acamar	315 51.5	-40 28.6	72	□	□	■	■	■	23 41	Alt.			
1	194 01.6	02.5	5	Achernar	335 59.1	-57 27.3	70	□	□	■	■	23 50	22 59				
2	209 01.5	02.3	30	Acrux	173 58.1	-62 51.6	68	□	□	■	■	22 47	22 31				
3	224 01.4	02.1	19	Adhara	255 47.0	-28 54.7	66	0 36	///	22 10	22 13	22 11	22 09	°			
4	239 01.3	01.9	10	Aldebaran	291 39.5	+16 25.3	64	1 45	///	21 12	21 35	21 46	21 52	0			
5	254 01.2	01.7					62	2 20	///	20 38	21 08	21 26	21 37	30	0.1	0.1	0.1
6	269 01.1	+23 01.5	32	Alioth	166 58.6	+56 12.3	60	2 44	///	20 14	20 47	21 09	21 25	45	0.1	0.1	0.0
7	284 00.9	01.3	34	Alkaid	153 32.8	+49 32.3	58	3 04	///	19 54	20 30	20 55	21 15	60	0.1	0.0	0.0
8	299 00.8	01.2	55	Al Na'ir	28 37.8	-47 10.3	56	3 20	///	19 38	20 15	20 44	21 05	75	0.1	0.0	0.0
9	314 00.7	01.0	15	Alnilam	276 30.7	-1 13.7	54	3 34	///	19 24	20 03	20 33	20 57	90	0.1	0.0	0.0
10	329 00.6	00.8	25	Alphard	218 39.0	-8 28.0	52	3 46	///	19 12	19 52	20 24	20 50	Moon's Lower Limb			
11	344 00.5	00.6					50	3 56	///	19 01	19 42	20 15	20 43	Add			
12	359 00.4	+23 00.4	41	Alphecca	126 47.5	+26 51.9	45	4 18	1 48	18 38	19 21	19 57	20 29	Alt.	3	4	5
13	14 00.2	00.2	1	Alpheratz	358 28.4	+28 50.7	40	4 36	2 33	18 20	19 04	19 43	20 17	°			
14	29 00.1	23 00.0	51	Altair	62 50.2	+8 45.1	35	4 50	3 04	18 05	18 50	19 30	20 07	0			
15	44 00.0	-22 59.8	2	Ankaa	353 58.4	-42 32.5	30	5 03	3 27	17 52	18 38	19 20	19 58	4	11.9	12.1	12.4
16	58 59.9	59.6	42	Antares	113 19.2	-26 20.2	20	5 25	4 00	17 29	18 17	19 01	19 43	8	11.9	12.1	12.4
17	73 59.8	59.4					10	5 43	4 26	17 10	17 58	18 45	19 29	12	11.9	12.2	12.4
18	88 59.7	+22 59.2	37	Arcturus	146 35.2	+19 24.8	0	6 01	4 45	16 52	17 41	18 29	19 17	16	11.9	12.2	12.4
19	103 59.6	59.0	43	Atria	108 59.6	-68 57.1	10	6 18	5 03	16 33	17 24	18 14	19 04	20	12.0	12.2	12.5
20	118 59.4	58.8	22	Avior	234 36.5	-59 22.1	20	6 36	5 18	16 14	17 05	17 58	18 50	24	12.1	12.3	12.6
21	133 59.3	58.6	13	Bellatrix	279 18.9	+6 18.7	30	6 57	5 32	15 51	16 44	17 39	18 35	28	12.2	12.4	12.6
22	148 59.2	58.4	16	Betelge'se	271 48.6	+7 24.0	35	7 09	5 39	15 38	16 32	17 28	18 26	32	12.2	12.5	12.7
23	163 59.1	58.2					40	7 22	5 45	15 23	16 17	17 15	18 15	36	12.4	12.6	12.8
0	178 59.0	+22 58.0	17	Canopus	264 16.0	-52 40.2	45	7 39	5 53	15 05	16 00	17 00	18 03	40	12.5	12.7	12.9
1	193 58.9	57.8	12	Capella	281 39.1	+45 57.2	50	7 59	6 00	14 42	15 39	16 42	17 48	44	12.6	12.8	13.0
2	208 58.8	57.6	53	Deneb	50 00.7	+45 07.2	52	8 08	6 04	14 32	15 29	16 33	17 41	48	12.7	12.9	13.1
3	223 58.6	57.4	28	Denebola	183 18.0	+14 49.2	56	8 19	6 07	14 19	15 17	16 23	17 33	52	12.9	13.1	13.3
4	238 58.5	57.2	4	Diphda	349 39.4	-18 13.6	54	8 31	6 11	14 05	15 04	16 12	17 25	56	13.1	13.2	13.4
5	253 58.4	57.0					58	8 46	6 14	13 49	14 49	15 59	17 15	60	13.2	13.4	13.5
6	268 58.3	+22 56.8	27	Dubhe	194 45.1	+61 59.7	60	9 02	6 19	13 29	14 31	15 44	17 03	64	13.4	13.5	13.7
7	283 58.2	56.6	14	Elnath	279 07.9	+28 34.3								68	13.6	13.7	13.9
8	298 58.1	56.4	47	Eltanin	91 05.8	+51 29.7								72	13.8	13.9	14.0
9	313 58.0	56.2	54	Enif	34 29.5	+9 40.3								76	14.0	14.1	14.2
10	328 57.8	56.0	56	Fomalhaut	16 11.6	-29 51.2								80	14.2	14.3	14.4
11	343 57.7	55.8												84	14.4	14.4	14.5
12	358 57.6	+22 55.6	31	Gacrux	172 49.5	-56 52.2	72	□	□	■	■	■	1 44	88	14.6	14.6	14.7
13	13 57.5	55.4	29	Gienah	176 37.1	-17 17.9	70	□	□	■	■	■	2 47	90	14.7	14.8	14.8
14	28 57.4	55.1	35	Hadar	149 49.4	-60 09.9	68	□	□	■	■	■	3 21	Add to table, back cover			
15	43 57.3	54.9	6	Hamal	328 49.9	+23 15.2	66	23 27	///	24 00	0 00	1 40	3 46	Moon's Upper Limb			
16	58 57.2	54.7	48	Kaus Aust.	84 41.0	-34 24.4	64	22 22	///	0 00	0 58	2 17	3 46	Subtract			
17	73 57.1	54.5					62	21 48	///	0 35	1 31	2 44	4 06	Alt.	3	4	5
18	88 56.9	+22 54.3	40	Kochab	137 17.2	+74 20.5	60	21 23	///	1 01	1 56	3 04	4 21	°			
19	103 56.8	54.1	57	Markab	14 21.4	+14 58.0	58	21 04	///	1 21	2 15	3 21	4 35	0	17.7	17.5	17.4
20	118 56.7	53.9	8	Menkar	315 00.7	+3 55.1	56	20 48	///	1 38	2 32	3 36	4 46	4	17.6	17.5	17.3
21	133 56.6	53.6	36	Menkent	148 58.7	-36 09.4	54	20 34	///	1 52	2 46	3 48	4 56	12	17.6	17.4	17.3
22	148 56.5	53.4	24	Miapl'dus	221 49.9	-69 32.3	52	20 22	///	2 04	2 58	3 59	5 05	16	17.5	17.4	17.2
23	163 56.4	53.2					50	20 12	///	2 15	3 08	4 08	5 13	20	17.5	17.3	17.2
0	178 56.3	+22 53.0	9	Mirfak	309 42.9	+49 42.2	45	19 50	22 19	2 38	3 30	4 28	5 30	24	17.4	17.2	17.1
1	193 56.2	52.8	50	Nunki	76 51.7	-26 21.2	40	19 32	21 33	2 56	3 48	4 45	5 44	28	17.3	17.2	17.0
2	208 56.1	52.6	52	Peacock	54 26.9	-56 52.6	35	19 18	21 04	3 12	4 03	4 58	5 56	32	17.2	17.1	16.9
3	223 55.9	52.3	21	Pollux	244 21.1	+28 08.1	30	19 05	20 41	3 25	4 16	5 10	6 06	36	17.0	16.9	16.8
4	238 55.8	52.1	20	Procyon	245 45.5	+5 20.4	20	18 44	20 08	3 48	4 38	5 30	6 23	40	16.9	16.8	16.7
5	253 55.7	51.9					10	18 25	19 42	4 08	4 58	5 48	6 38	44	16.8	16.7	16.6
6	268 55.6	+22 51.7	46	R'alhague	96 46.4	+12 35.5	0	18 08	19 23	4 26	5 16	6 04	6 52	48	16.6	16.6	16.5
7	283 55.5	51.5	26	Regulus	208 29.9	+12 11.1	10	17 51	19 06	4 44	5 33	6 21	7 06	52	16.5	16.4	16.3
8	298 55.4	51.2	11	Rigel	281 54.1	-8 15.0	20	17 33	18 51	5 04	5 52	6 38	7 21	56	16.3	16.2	16.2
9	313 55.3	51.0	38	Rigel Kent.	140 50.9	-60 39.5	30	17 12	18 37	5 27	6 14	6 58	7 38	60	16.1	16.1	16.0
10	328 55.2	50.8	44	Sabik	103 02.0	-15 40.3	35	17 00	18 30	5 40	6 27	7 10	7 48	64	15.9	15.9	15.9
11	343 55.1	50.6					40	16 47	18 24	5 55	6 42	7 23	7 59	68	15.8	15.7	15.7
12	358 55.0	+22 50.3	3	Schedar	350 30.1	+56 17.5	45	16 30	18 16	6 13	6 59	7 39	8 13	72	15.6	15.6	15.6
13	13 54.8	50.1	45	Shaula	97 20.5	-37 04.4	50	16 10	18 09	6 36	7 21	7 58	8 28	76	15.4	15.4	15.4
14	28 54.7	49.9	18	Sirius	259 12.3	-16 39.2	52	16 01	18 06	6 47	7 31	8 07	8 36	80	15.2	15.2	15.2
15	43 54.6	49.7	33	Spica	159 17.0	-10 55.9	54	15 50	18 02	6 59	7 43	8 17	8 44	84	15.0	15.0	15.0
16	58 54.5	49.4	23	Suhail	223 24.8	-43 15.3	56	15 38	17 59	7 13	7 56	8 29	8 53	88	14.8	14.9	14.9
17	73 54.4	49.2					58	15 23	17 54	7 30	8 11	8 42	9 04	90			
18	88 54.3	+22 49.0	49	Vega	81 07.9	+38 44.5	60	15 07	17 51	7 49	8 29	8 57	9 16	Subtract from table, back cover			
19	103 54.2	48.7	39	Zub'g'bi	137 53.3	-15 51.6								Independence Day 4			
20	118 54.1	48.5												Full Moon			
21	133 54.0	48.3															
22	148 53.9	48.0															
23	163 53.8	47.8															
24	178 53.7	+22 47.6															

G M T	VENUS - 3.3		MARS 2.0		JUPITER - 1.3		SATURN 0.6		MOON			
	GHA	GHA Dec.	GHA Dec.	GHA Dec.	GHA Dec.	GHA Dec.	GHA code Dec. code					
h	o		o		o		o		o			
6	0	283 12.2	195 52.3 +23 08.2	164 24.3 +21 57.3	156 01.1 +19 36.6	60 18.2 -13 58.4	350 05.5 122 -19 27.5 + 72					
	1	298 14.6	210 51.5 08.4	179 25.1 57.0	171 03.0 36.5	75 20.7 58.4	4 36.7 123 19 20.3 + 74					
	2	313 17.1	225 50.6 08.5	194 25.8 56.7	186 04.9 36.4	90 23.2 58.4	19 08.0 122 19 12.9 + 74					
	3	328 19.5	240 49.8 08.7	209 26.6 56.4	201 06.8 36.2	105 25.8 58.4	33 39.2 124 -19 05.5 + 76					
	4	343 22.0	255 48.9 08.8	224 27.4 56.1	216 08.7 36.1	120 28.3 58.4	48 10.6 123 18 57.9 + 76					
	5	358 24.5	270 48.0 09.0	239 28.1 55.8	231 10.7 36.0	135 30.8 58.4	62 41.9 124 18 50.3 + 77					
	6	13 26.9	285 47.2 +23 09.2	254 28.9 +21 55.5	246 12.6 +19 35.9	150 33.3 -13 58.4	77 13.3 124 -18 42.6 + 78					
	7	28 29.4	300 46.3 09.3	269 29.7 55.2	261 14.5 35.7	165 35.8 58.4	91 44.7 124 18 34.8 + 79					
	8	43 31.9	315 45.5 09.5	284 30.4 54.9	276 16.4 35.6	180 38.4 58.4	106 16.1 125 18 26.9 + 80					
	9	58 34.3	330 44.6 09.6	299 31.2 54.6	291 18.3 35.5	195 40.9 58.4	120 47.6 125 -18 18.9 + 80					
	10	73 36.8	345 43.8 09.8	314 32.0 54.3	306 20.2 35.4	210 43.4 58.4	135 19.1 125 18 10.9 + 82					
	11	88 39.3	0 42.9 09.9	329 32.7 54.0	321 22.1 35.2	225 45.9 58.4	149 50.6 126 18 02.7 + 82					
	12	103 41.7	15 42.1 +23 10.1	344 33.5 +21 53.6	336 24.1 +19 35.1	240 48.4 -13 58.4	164 22.2 126 -17 54.5 + 84					
	13	118 44.2	30 41.2 10.2	359 34.3 53.3	351 26.0 35.0	255 50.9 58.4	178 53.8 126 17 46.1 + 84					
	14	133 46.7	45 40.4 10.3	14 35.0 53.0	6 27.9 34.9	270 53.5 58.4	193 25.4 127 17 37.7 + 85					
	15	148 49.1	60 39.5 10.5	29 35.8 52.7	21 29.8 34.7	285 56.0 58.4	207 57.1 127 -17 29.2 + 85					
	16	163 51.6	75 38.7 10.6	44 36.6 52.4	36 31.7 34.6	300 58.5 58.4	222 28.8 127 17 20.7 + 87					
	17	178 54.0	90 37.8 10.8	59 37.3 52.1	51 33.6 34.5	316 01.0 58.4	237 00.5 128 17 12.0 + 87					
	18	193 56.5	105 37.0 +23 10.9	74 38.1 +21 51.8	66 35.6 +19 34.4	331 03.5 -13 58.4	251 32.3 128 -17 03.3 + 89					
	19	208 59.0	120 36.1 11.1	89 38.9 51.5	81 37.5 34.2	346 06.0 58.4	266 04.1 128 16 54.4 + 89					
	20	224 01.4	135 35.3 11.2	104 39.6 51.2	96 39.4 34.1	1 08.6 58.3	280 35.9 128 16 45.5 + 89					
	21	239 03.9	150 34.4 11.3	119 40.4 50.9	111 41.3 34.0	16 11.1 58.3	295 07.7 129 -16 36.6 + 91					
	22	254 06.4	165 33.6 11.5	134 41.2 50.6	126 43.2 33.8	31 13.6 58.3	309 39.6 129 16 27.5 + 91					
	23	269 08.8	180 32.7 11.6	149 41.9 50.3	141 45.1 33.7	46 16.1 58.3	324 11.5 130 16 18.4 + 93					
7	0	284 11.3	195 31.8 +23 11.7	164 42.7 +21 49.9	156 47.0 +19 33.6	61 18.6 -13 58.3	338 43.5 130 -16 09.1 + 92					
	1	299 13.8	210 31.0 11.9	179 43.5 49.6	171 49.0 33.5	76 21.1 58.3	353 15.5 130 15 59.9 + 94					
	2	314 16.2	225 30.1 12.0	194 44.3 49.3	186 50.9 33.3	91 23.7 58.3	7 47.5 130 15 50.5 + 95					
	3	329 18.7	240 29.3 12.1	209 45.0 49.0	201 52.8 33.2	106 26.2 58.3	22 19.5 131 -15 41.0 + 95					
	4	344 21.1	255 28.4 12.2	224 45.8 48.7	216 54.7 33.1	121 28.7 58.3	36 51.6 131 15 31.5 + 96					
	5	359 23.6	270 27.6 12.4	239 46.6 48.4	231 56.6 33.0	136 31.2 58.3	51 23.7 132 15 21.9 + 97					
	6	14 26.1	285 26.7 +23 12.5	254 47.3 +21 48.1	246 58.5 +19 32.8	151 33.7 -13 58.3	65 55.9 131 -15 12.2 + 97					
	7	29 28.5	300 25.9 12.6	269 48.1 47.8	262 00.4 32.7	166 36.2 58.3	80 28.0 132 15 02.5 + 98					
	8	44 31.0	315 25.0 12.8	284 48.9 47.5	277 02.4 32.6	181 38.8 58.3	95 00.2 133 14 52.7 + 99					
	9	59 33.5	330 24.2 12.9	299 49.6 47.1	292 04.3 32.4	196 41.3 58.3	109 32.5 132 -14 42.8 + 99					
	10	74 35.9	345 23.3 13.0	314 50.4 46.8	307 06.2 32.3	211 43.8 58.3	124 04.7 133 14 32.9 +101					
	11	89 38.4	0 22.4 13.1	329 51.2 46.5	322 08.1 32.2	226 46.3 58.3	138 37.0 133 14 22.8 +101					
	12	104 40.9	15 21.6 +23 13.2	344 52.0 +21 46.2	337 10.0 +19 32.1	241 48.8 -13 58.3	153 09.3 134 -14 12.7 +101					
	13	119 43.3	30 20.7 13.4	359 52.7 45.9	352 11.9 31.9	256 51.3 58.3	167 41.7 133 14 02.6 +103					
	14	134 45.8	45 19.9 13.5	14 53.5 45.6	7 13.8 31.8	271 53.8 58.3	182 14.0 134 13 52.3 +103					
	15	149 48.3	60 19.0 13.6	29 54.3 45.3	22 15.8 31.7	286 56.4 58.3	196 46.4 134 -13 42.0 +103					
	16	164 50.7	75 18.2 13.7	44 55.0 44.9	37 17.7 31.6	301 58.9 58.3	211 18.8 135 13 31.7 +105					
	17	179 53.2	90 17.3 13.8	59 55.8 44.6	52 19.6 31.4	317 01.4 58.3	225 51.3 135 13 21.2 +105					
	18	194 55.6	105 16.4 +23 13.9	74 56.6 +21 44.3	67 21.5 +19 31.3	332 03.9 -13 58.3	240 23.8 135 -13 10.7 +105					
	19	209 58.1	120 15.6 14.0	89 57.4 44.0	82 23.4 31.2	347 06.4 58.3	254 56.3 135 13 00.2 +106					
	20	225 00.6	135 14.7 14.1	104 58.1 43.7	97 25.3 31.1	2 08.9 58.2	269 28.8 135 12 49.6 +107					
	21	240 03.0	150 13.9 14.3	119 58.9 43.4	112 27.2 30.9	17 11.4 58.2	284 01.3 136 -12 38.9 +108					
	22	255 05.5	165 13.0 14.4	134 59.7 43.1	127 29.2 30.8	32 13.9 58.2	298 33.9 136 12 28.1 +108					
	23	270 08.0	180 12.2 14.5	150 00.4 42.7	142 31.1 30.7	47 16.5 58.2	313 06.5 136 12 17.3 +108					
8	0	285 10.4	195 11.3 +23 14.6	165 01.2 +21 42.4	157 33.0 +19 30.5	62 19.0 -13 58.2	327 39.1 136 -12 06.5 +110					
	1	300 12.9	210 10.4 14.7	180 02.0 42.1	172 34.9 30.4	77 21.5 58.2	342 11.7 137 11 55.5 +110					
	2	315 15.4	225 09.6 14.8	195 02.8 41.8	187 36.8 30.3	92 24.0 58.2	356 44.4 137 11 44.5 +110					
	3	330 17.8	240 08.7 14.9	210 03.5 41.5	202 38.7 30.2	107 26.5 58.2	11 17.1 137 -11 33.5 +111					
	4	345 20.3	255 07.9 15.0	225 04.3 41.1	217 40.6 30.0	122 29.0 58.2	25 49.8 137 11 22.4 +112					
	5	0 22.8	270 07.0 15.1	240 05.1 40.8	232 42.6 29.9	137 31.5 58.2	40 22.5 138 11 11.2 +112					
	6	15 25.2	285 06.2 +23 15.2	255 05.9 +21 40.5	247 44.5 +19 29.8	152 34.0 -13 58.2	54 55.3 137 -11 00.0 +113					
	7	30 27.7	300 05.3 15.3	270 06.6 40.2	262 46.4 29.6	167 36.5 58.2	69 28.0 138 10 48.7 +113					
	8	45 30.1	315 04.4 15.4	285 07.4 39.9	277 48.3 29.5	182 39.1 58.2	84 00.8 138 10 37.4 +114					
	9	60 32.6	330 03.6 15.5	300 08.2 39.6	292 50.2 29.4	197 41.6 58.2	98 33.6 138 10 26.0 +114					
	10	75 35.1	345 02.7 15.6	315 08.9 39.2	307 52.1 29.3	212 44.1 58.2	113 06.4 139 10 14.6 +115					
	11	90 37.5	0 01.9 15.7	330 09.7 38.9	322 54.0 29.1	227 46.6 58.2	127 39.3 138 10 03.1 +115					
	12	105 40.0	15 01.0 +23 15.7	345 10.5 +21 38.6	337 55.9 +19 29.0	242 49.1 -13 58.2	142 12.1 139 -9 51.6 +116					
	13	120 42.5	30 00.1 15.8	0 11.3 38.3	352 57.9 28.9	257 51.6 58.2	156 45.0 139 9 40.0 +116					
	14	135 44.9	44 59.3 15.9	15 12.0 38.0	7 59.8 28.8	272 54.1 58.2	171 17.8 139 9 28.4 +117					
	15	150 47.4	59 58.4 16.0	30 12.8 37.6	23 01.7 28.6	287 56.6 58.2	185 50.7 139 9 16.7 +117					
	16	165 49.9	74 57.6 16.1	45 13.6 37.3	38 03.6 28.5	302 59.1 58.2	200 23.6 140 9 05.0 +118					
	17	180 52.3	89 56.7 16.2	60 14.4 37.0	53 05.5 28.4	318 01.6 58.2	214 56.6 139 8 53.2 +118					
	18	195 54.8	104 55.8 +23 16.3	75 15.1 +21 36.7	68 07.4 +19 28.2	333 04.2 -13 58.2	229 29.5 139 -8 41.4 +119					
	19	210 57.2	119 55.0 16.3	90 15.9 36.3	83 09.3 28.1	348 06.7 58.2	244 02.4 140 8 29.5 +119					
	20	225 59.7	134 54.1 16.4	105 16.7 36.0	98 11.2 28.0	3 09.2 58.2	258 35.4 140 8 17.6 +120					
	21	241 02.2	149 53.3 16.5	120 17.5 35.7	113 13.2 27.9	18 11.7 58.2	273 08.4 139 8 05.6 +120					
	22	256 04.6	164 52.4 16.6	135 18.2 35.4	128 15.1 27.7	33 14.2 58.2	287 41.3 140 7 53.6 +120					
	23	271 07.1	179 51.5 16.7	150 19.0 35.1	143 17.0 27.6	48 16.7 58.2	302 14.3 140 7 41.6 +121					
24		286 09.6	194 50.7 +23 16.7	165 19.8 +21 34.7	158 18.9 +19 27.5	63 19.2 -13 58.2	316 47.3 140 -7 29.5 +121					
code	-	- 9 + 2	+ 7 - 3	+ 19 - 2	+ 25 0							

G M T	SUN		STARS				Lat.	Sunrise	Twilt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS			
	GHA	Dec.	No.	Name	SHA	Dec.											
										6	7	8	9				
h							N	h m	h m	h m	h m	h m	h m	Alt.	Sun's Low'r Limb	Venus	Mars
0	178 53.7	+22 47.6	7	Acamar	315 51.4	-40 28.6	72	□	□	23 41	22 58	22 31	22 10				
1	193 53.5	47.3	5	Achernar	335 59.0	-57 27.3	70	□	□	22 59	22 37	22 20	22 06				
2	208 53.4	47.1	30	Acrux	173 58.1	-62 51.6	68	□	□	22 31	22 20	22 11	22 03		Add	Add	Add
3	223 53.3	46.9	19	Adhara	255 47.0	-28 54.6	66	0 53	///	22 09	22 06	22 03	22 00	°			
4	238 53.2	46.6	10	Aldebaran	291 39.5	+16 25.3	64	1 52	///	21 52	21 55	21 56	21 57	0			
5	253 53.1	46.4					62	2 25	///	21 37	21 45	21 51	21 55	30	0.1	0.1	0.1
6	268 53.0	+22 46.2	32	Alioth	166 58.6	+56 12.3	60	2 49	///	21 25	21 37	21 46	21 54	45	0.1	0.1	0.0
7	283 52.9	45.9	34	Alkaid	153 32.9	+49 32.3	58	3 08	///	21 15	21 29	21 41	21 52	60	0.1	0.0	0.0
8	298 52.8	45.7	55	Al Na'ir	28 37.8	-47 10.3	56	3 23	///	21 05	21 23	21 37	21 51	75	0.1	0.0	0.0
9	313 52.7	45.4	15	Anilam	276 30.7	-1 13.7	54	3 37	///	20 57	21 17	21 34	21 49	90	0.1	0.0	0.0
10	328 52.6	45.2	25	Alphard	218 39.0	-8 28.0	52	3 48	///	20 50	21 12	21 31	21 48				
11	343 52.5	45.0					50	3 59	///	20 43	21 07	21 28	21 47	Moon's Lower Limb			
12	358 52.4	+22 44.7	41	Alphecca	126 47.5	+26 51.9	45	4 20	1 52	20 29	20 56	21 21	21 45	Add			
13	13 52.3	44.5	1	Alpheratz	358 28.4	+28 50.7	40	4 38	2 36	20 17	20 48	21 16	21 43	Alt.	6	7	8
14	28 52.2	44.2	51	Altair	62 50.2	+8 45.1	35	4 52	3 06	20 07	20 40	21 11	21 41	°			
15	43 52.1	44.0	2	Ankaa	353 58.4	-42 32.5	30	5 05	3 29	19 58	20 34	21 07	21 39	0			
16	58 52.0	43.7	42	Antares	113 19.2	-26 20.2	20	5 26	4 02	19 43	20 22	21 00	21 37	4	12.8	13.3	13.9
17	73 51.8	43.5					10	5 44	4 27	19 29	20 12	20 53	21 34	8	12.8	13.3	13.9
18	88 51.7	+22 43.3	37	Arcturus	146 35.2	+19 24.8	0	6 01	4 46	19 17	20 03	20 48	21 32	12	12.8	13.3	13.9
19	103 51.6	43.0	43	Atria	108 59.6	-68 57.1	10	6 18	5 03	19 04	19 53	20 42	21 30	16	12.9	13.3	13.9
20	118 51.5	42.8	22	Avior	234 36.5	-59 22.1	20	6 36	5 18	18 50	19 40	20 35	21 28	20	12.9	13.3	14.0
21	133 51.4	42.5	13	Bellatrix	279 18.9	+6 18.7	30	6 56	5 31	18 35	19 31	20 28	21 25	24	13.0	13.4	14.0
22	148 51.3	42.3	16	Betelge'se	271 48.6	+7 24.0	35	7 08	5 38	18 26	19 25	20 24	21 23	28	13.0	13.5	14.1
23	163 51.2	42.0					40	7 22	5 45	18 15	19 17	20 19	21 22	32	13.1	13.6	14.1
			17	Canopus	264 16.0	-52 40.2	45	7 38	5 52	18 03	19 08	20 13	21 20	36	13.2	13.6	14.2
			12	Capella	281 39.1	+45 57.2	50	7 58	6 00	17 48	18 57	20 07	21 17	40	13.3	13.7	14.2
7	178 51.1	+22 41.8	53	Deneb	50 00.7	+45 07.2	52	8 07	6 03	17 41	18 52	20 04	21 16	44	13.4	13.8	14.3
1	193 51.0	41.5	28	Denebola	183 18.0	+14 49.2	54	8 18	6 06	17 33	18 46	20 00	21 15	48	13.5	13.9	14.4
2	208 50.9	41.3	4	Diphda	349 39.4	-18 13.6	56	8 30	6 10	17 25	18 40	19 56	21 14	52	13.7	14.0	14.4
3	223 50.8	41.0					58	8 43	6 13	17 15	18 33	19 52	21 12	56	13.8	14.1	14.5
4	238 50.7	40.8					60	9 00	6 18	17 03	18 25	19 47	21 11	60	13.9	14.2	14.6
5	253 50.6	40.5	27	Dubhe	194 45.1	+61 59.7								64	14.1	14.3	14.7
6	268 50.5	+22 40.2	14	Elnath	279 07.9	+28 34.3								68	14.2	14.4	14.8
7	283 50.4	40.0	47	Eltanin	91 05.8	+51 29.7								72	14.3	14.6	14.8
8	298 50.3	39.7	54	Enif	34 29.5	+9 40.3								76	14.5	14.7	14.9
9	313 50.2	39.5	56	Fomalhaut	16 11.6	-29 51.2								80	14.6	14.8	15.0
10	328 50.1	39.2												84	14.8	14.9	15.1
11	343 50.0	39.0	31	Gacrux	172 49.5	-56 52.2	72	□	□	1 44	4 13	6 10	8 00	88	14.9	15.0	15.2
12	358 49.9	+22 38.7	29	Gienah	176 37.1	-17 17.9	70	□	□	2 47	4 40	6 26	8 08		Add to table, back cover		
13	13 49.8	38.4	35	Hadar	149 49.4	-60 09.9	68	□	□	3 21	5 01	6 38	8 14				
14	28 49.7	38.2	6	Hamal	328 49.9	+23 15.2	66	23 12	///	3 46	5 17	6 48	8 19				
15	43 49.6	37.9	48	Kaus Aust.	84 41.0	-34 24.4	64	22 46	///	4 06	5 31	6 57	8 23				
16	58 49.5	37.7					62	21 44	///	4 21	5 42	7 04	8 27				
17	73 49.4	37.4	40	Kochab	137 17.3	+74 20.5	60	21 20	///	4 35	5 52	7 11	8 30				
18	88 49.3	+22 37.1	57	Markab	14 21.4	+14 58.0	58	21 01	///	4 46	6 00	7 16	8 33				
19	103 49.2	36.9	8	Menkar	315 00.6	+3 55.1	56	20 46	///	4 56	6 08	7 21	8 36				
20	118 49.1	36.6	36	Menkent	148 58.7	-36 09.4	54	20 32	///	5 05	6 15	7 26	8 38				
21	133 49.0	36.3	24	Miap'dus	221 49.9	-69 32.3	52	20 21	///	5 13	6 21	7 30	8 40				
22	148 48.9	36.1					50	20 10	///	5 30	6 34	7 39	8 45				
23	163 48.8	35.8	9	Mirfak	309 42.9	+49 42.2	45	19 49	22 16	5 44	6 45	7 47	8 49				
			50	Nunki	76 51.7	-26 21.2	40	19 32	21 32	5 56	6 54	7 53	8 52				
			52	Peacock	54 26.9	-56 52.6	35	19 17	21 02	6 06	7 02	7 59	8 55				
8	178 48.7	+22 35.5	21	Pollux	244 21.1	+28 08.1	30	19 05	20 40	6 23	7 16	8 08	9 00				
1	193 48.6	35.3	20	Procyon	245 45.5	+5 20.4	20	18 44	20 07	6 38	7 28	8 16	9 05				
2	208 48.5	35.0					10	18 25	19 42	6 52	7 39	8 24	9 09				
3	223 48.4	34.7	46	R'alhague	96 46.4	+12 35.5	0	18 08	19 23	7 06	7 50	8 32	9 13				
4	238 48.3	34.5	26	Regulus	208 29.9	+12 11.1	10	17 52	19 07	7 21	8 02	8 40	9 17				
5	253 48.2	34.2	11	Rigel	281 54.1	-8 15.0	20	17 34	18 52	7 38	8 15	8 49	9 22				
6	268 48.1	+22 33.9	38	Rigel Kent.	140 50.9	-60 39.6	30	17 14	18 39	7 48	8 23	8 55	9 25				
7	283 48.0	33.7	44	Sabik	103 02.0	-15 40.3	35	17 02	18 32	7 59	8 32	9 01	9 28				
8	298 47.9	33.4					40	16 48	18 25	8 13	8 42	9 08	9 32				
9	313 47.8	33.1	3	Schedar	350 30.1	+56 17.5	45	16 32	18 18	8 28	8 54	9 16	9 36				
10	328 47.7	32.8	45	Shaula	97 20.5	-37 04.4	50	16 12	18 10	8 44	9 06	9 24	9 40				
11	343 47.6	32.6	18	Sirius	259 12.3	-16 39.2	52	16 03	18 07	8 53	9 13	9 29	9 42				
12	358 47.5	+22 32.3	33	Spica	159 17.0	-10 55.9	54	15 52	18 04	9 04	9 20	9 34	9 45				
13	13 47.4	32.0	23	Suhail	223 24.8	-43 15.3	56	15 40	18 00	9 16	9 29	9 39	9 48				
14	28 47.3	31.7					58	15 27	17 57								
15	43 47.2	31.5	49	Vega	81 07.9	+38 44.6	60	15 10	17 53								
16	58 47.1	31.2	39	Zub'g'bi	137 53.4	-15 51.6											
17	73 47.0	30.9															
18	88 46.9	+22 30.6															
19	103 46.8	30.4															
20	118 46.7	30.1															
21	133 46.6	29.8															
22	148 46.5	29.5															

G M T	VENUS -3.3		MARS 2.0		JUPITER -1.3		SATURN 0.6		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
9	h											
0	286 09.6	194 50.7 +23 16.7	165 19.8 +21 34.7	158 18.9 +19 27.5	63 19.2 -13 58.2	316 47.3 140 - 7 29.5 +121						
1	301 12.0	209 49.8 16.8	180 20.6 34.4	173 20.8 27.3	78 21.7 58.2	331 20.3 140 7 17.4 +122						
2	316 14.5	224 49.0 16.9	195 21.3 34.1	188 22.7 27.2	93 24.2 58.2	345 53.3 140 7 05.2 +122						
3	331 17.0	239 48.1 .. 17.0	210 22.1 .. 33.8	203 24.6 .. 27.1	108 26.7 .. 58.2	0 26.3 140 - 6 53.0 +123						
4	346 19.4	254 47.2 17.0	225 22.9 33.4	218 26.5 27.0	123 29.2 58.2	14 59.3 140 6 40.7 +122						
5	1 21.9	269 46.4 17.1	240 23.7 33.1	233 28.5 26.8	138 31.8 58.2	29 32.3 140 6 28.5 +124						
6	16 24.4	284 45.5 +23 17.2	255 24.5 +21 32.8	248 30.4 +19 26.7	153 34.3 -13 58.2	44 05.3 141 - 6 16.1 +123						
7	31 26.8	299 44.7 17.2	270 25.2 32.5	263 32.3 26.6	168 36.8 58.2	58 38.4 140 6 03.8 +124						
8	46 29.3	314 43.8 17.3	285 26.0 32.1	278 34.2 26.4	183 39.3 58.2	73 11.4 140 5 51.4 +124						
9	61 31.7	329 42.9 .. 17.4	300 26.8 .. 31.8	293 36.1 .. 26.3	198 41.8 .. 58.2	87 44.4 140 - 5 39.0 +125						
10	76 34.2	344 42.1 17.4	315 27.6 31.5	308 38.0 26.2	213 44.3 58.2	102 17.4 140 5 26.5 +125						
11	91 36.7	359 41.2 17.5	330 28.3 31.2	323 39.9 26.1	228 46.8 58.2	116 50.4 141 5 14.0 +125						
12	106 39.1	14 40.4 +23 17.6	345 29.1 +21 30.8	338 41.9 +19 25.9	243 49.3 -13 58.2	131 23.5 140 - 5 01.5 +126						
13	121 41.6	29 39.5 17.6	0 29.9 30.5	353 43.8 25.8	258 51.8 58.2	145 56.5 140 4 48.9 +126						
14	136 44.1	44 38.6 17.7	15 30.7 30.2	8 45.7 25.7	273 54.3 58.2	160 29.5 140 4 36.3 +126						
15	151 46.5	59 37.8 .. 17.8	30 31.5 .. 29.9	23 47.6 .. 25.5	288 56.8 .. 58.2	175 02.5 140 - 4 23.7 +126						
16	166 49.0	74 36.9 17.8	45 32.2 29.5	38 49.5 25.4	303 59.3 58.1	189 35.5 140 4 11.1 +127						
17	181 51.5	89 36.0 17.9	60 33.0 29.2	53 51.4 25.3	319 01.8 58.1	204 08.5 140 3 58.4 +127						
18	196 53.9	104 35.2 +23 17.9	75 33.8 +21 28.9	68 53.3 +19 25.1	334 04.3 -13 58.1	218 41.5 140 - 3 45.7 +127						
19	211 56.4	119 34.3 18.0	90 34.6 28.5	83 55.2 25.0	349 06.8 58.1	233 14.5 139 3 33.0 +128						
20	226 58.9	134 33.5 18.0	105 35.3 28.2	98 57.1 24.9	4 09.3 58.1	247 47.4 140 3 20.2 +127						
21	242 01.3	149 32.6 .. 18.1	120 36.1 .. 27.9	113 59.1 .. 24.8	19 11.9 .. 58.1	262 20.4 139 - 3 07.5 +128						
22	257 03.8	164 31.7 18.1	135 36.9 27.6	129 01.0 24.6	34 14.4 58.1	276 53.3 140 2 54.7 +129						
23	272 06.2	179 30.9 18.2	150 37.7 27.2	144 02.9 24.5	49 16.9 58.1	291 26.3 139 2 41.8 +128						
10	0	287 08.7	194 30.0 +23 18.2	165 38.5 +21 26.9	159 04.8 +19 24.4	64 19.4 -13 58.1	305 59.2 139 - 2 29.0 +129					
1	302 11.2	209 29.1 18.3	180 39.2 26.6	174 06.7 24.2	79 21.9 58.1	320 32.1 139 2 16.1 +129						
2	317 13.6	224 28.3 18.3	195 40.0 26.2	189 08.6 24.1	94 24.4 58.1	335 05.0 139 2 03.2 +129						
3	332 16.1	239 27.4 .. 18.4	210 40.8 .. 25.9	204 10.5 .. 24.0	109 26.9 .. 58.1	349 37.9 138 - 1 50.3 +129						
4	347 18.6	254 26.6 18.4	225 41.6 25.6	219 12.4 23.9	124 29.4 58.1	4 10.7 139 1 37.4 +129						
5	2 21.0	269 25.7 18.5	240 42.4 25.2	234 14.4 23.7	139 31.9 58.1	18 43.6 138 1 24.5 +130						
6	17 23.5	284 24.8 +23 18.5	255 43.1 +21 24.9	249 16.3 +19 23.6	154 34.4 -13 58.1	33 16.4 138 - 1 11.5 +130						
7	32 26.0	299 24.0 18.5	270 43.9 24.6	264 18.2 23.5	169 36.9 58.1	47 49.2 138 0 58.5 +129						
8	47 28.4	314 23.1 18.6	285 44.7 24.2	279 20.1 23.3	184 39.4 58.1	62 22.0 138 0 45.6 +130						
9	62 30.9	329 22.2 .. 18.6	300 45.5 .. 23.9	294 22.0 .. 23.2	199 41.9 .. 58.1	76 54.8 137 - 0 32.6 +131						
10	77 33.4	344 21.4 18.7	315 46.3 23.6	309 23.9 23.1	214 44.4 58.1	91 27.5 137 0 19.5 +130						
11	92 35.8	359 20.5 18.7	330 47.0 23.2	324 25.8 22.9	229 46.9 58.1	106 00.2 137 - 0 06.5 +130						
12	107 38.3	14 19.6 +23 18.7	345 47.8 +21 22.9	339 27.7 +19 22.8	244 49.4 -13 58.1	120 32.9 137 + 0 06.5 +131						
13	122 40.7	29 18.8 18.8	0 48.6 22.6	354 29.6 22.7	259 51.9 58.1	135 05.6 137 0 19.6 +130						
14	137 43.2	44 17.9 18.8	15 49.4 22.2	9 31.6 22.6	274 54.4 58.1	149 38.3 136 0 32.6 +131						
15	152 45.7	59 17.0 .. 18.8	30 50.2 .. 21.9	24 33.5 .. 22.4	289 56.9 .. 58.1	164 10.9 136 - 0 45.7 +131						
16	167 48.1	74 16.2 18.8	45 51.0 21.6	39 35.4 22.3	304 59.4 58.1	178 43.5 135 0 58.8 +130						
17	182 50.6	89 15.3 18.9	60 51.7 21.2	54 37.3 22.2	320 01.9 58.1	193 16.0 135 1 11.8 +131						
18	197 53.1	104 14.5 +23 18.9	75 52.5 +21 20.9	69 39.2 +19 22.0	335 04.4 -13 58.1	207 48.5 135 + 1 24.9 +131						
19	212 55.5	119 13.6 18.9	90 53.3 20.6	84 41.1 21.9	350 06.9 58.1	222 21.0 135 1 38.0 +131						
20	227 58.0	134 12.7 .. 19.0	105 54.1 20.2	99 43.0 21.8	5 09.4 58.1	236 53.5 134 1 51.1 +131						
21	243 00.5	149 11.9 .. 19.0	120 54.9 .. 19.9	114 44.9 .. 21.6	20 11.9 .. 58.1	251 25.9 134 - 2 04.2 +131						
22	258 02.9	164 11.0 19.0	135 55.6 19.6	129 46.8 21.5	35 14.4 58.1	265 58.3 134 2 17.3 +131						
23	273 05.4	179 10.1 19.0	150 56.4 19.2	144 48.8 21.4	50 16.9 58.1	280 30.7 133 2 30.4 +131						
11	0	288 07.8	194 09.3 +23 19.0	165 57.2 +21 18.9	159 50.7 +19 21.3	65 19.4 -13 58.1	295 03.0 133 + 2 43.5 +131					
1	303 10.3	209 08.4 19.1	180 58.0 18.6	174 52.6 21.1	80 21.9 58.1	309 35.3 133 2 56.6 +131						
2	318 12.8	224 07.5 19.1	195 58.8 18.2	189 54.5 21.0	95 24.4 58.1	324 07.6 132 3 09.7 +131						
3	333 15.2	239 06.7 .. 19.1	210 59.6 .. 17.9	204 56.4 .. 20.9	110 26.9 .. 58.1	338 39.8 131 - 3 22.8 +131						
4	348 17.7	254 05.8 19.1	226 00.3 17.6	219 58.3 20.7	125 29.4 58.1	353 11.9 132 3 35.9 +131						
5	3 20.2	269 04.9 19.1	241 01.1 17.2	235 00.2 20.6	140 31.9 58.1	7 44.1 130 3 49.0 +131						
6	18 22.6	284 04.1 +23 19.1	256 01.9 +21 16.9	250 02.1 +19 20.5	155 34.4 -13 58.1	22 16.1 131 + 4 02.1 +130						
7	33 25.1	299 03.2 19.2	271 02.7 16.5	265 04.0 20.3	170 36.9 58.1	36 48.2 130 4 15.1 +131						
8	48 27.6	314 02.3 19.2	286 03.5 16.2	280 05.9 20.2	185 39.4 58.1	51 20.2 129 4 28.2 +130						
9	63 30.0	329 01.5 .. 19.2	301 04.3 .. 15.9	295 07.9 .. 20.1	200 41.9 .. 58.1	65 52.1 129 - 4 41.2 +131						
10	78 32.5	344 00.6 19.2	316 05.0 15.5	310 09.8 20.0	215 44.4 58.1	80 24.0 129 4 54.3 +130						
11	93 35.0	358 59.8 19.2	331 05.8 15.2	325 11.7 19.8	230 46.9 58.1	94 55.9 128 5 07.3 +130						
12	108 37.4	13 58.9 +23 19.2	346 06.6 +21 14.8	340 13.6 +19 19.7	245 49.4 -13 58.1	109 27.7 128 + 5 20.3 +130						
13	123 39.9	28 58.0 19.2	1 07.4 14.5	355 15.5 19.6	260 51.9 58.1	123 59.5 127 5 33.3 +130						
14	138 42.3	43 57.2 19.2	16 08.2 14.2	10 17.4 19.4	275 54.4 58.1	138 31.2 126 5 46.3 +130						
15	153 44.8	58 56.3 .. 19.2	31 09.0 .. 13.8	25 19.3 .. 19.3	290 56.9 .. 58.1	153 02.8 126 - 5 59.3 +130						
16	168 47.3	73 55.4 19.2	46 09.8 13.5	40 21.2 19.2	305 59.4 58.1	167 34.4 125 6 12.3 +129						
17	183 49.7	88 54.6 19.2	61 10.5 13.1	55 23.1 19.0	321 01.9 58.1	182 05.9 125 6 25.2 +129						
18	198 52.2	103 53.7 +23 19.2	76 11.3 +21 12.8	70 25.1 +19 18.9	336 04.4 -13 58.2	196 37.4 125 + 6 38.1 +129						
19	213 54.7	118 52.8 19.2	91 12.1 12.5	85 27.0 18.8	351 06.9 58.2	211 08.9 123 6 51.0 +129						
20	228 57.1	133 52.0 19.2	106 12.9 12.1	100 28.9 18.6	6 09.4 58.2	225 40.2 124 7 03.9 +129						
21	243 59.6	148 51.1 .. 19.2	121 13.7 .. 11.8	115 30.8 .. 18.5	21 11.9 .. 58.2	240 11.6 122 - 7 16.8 +128						
22	259 02.1	163 50.2 19.2	136 14.5 11.4	130 32.7 18.4	36 14.4 58.2	254 42.8 122 7 29.6 +128						
23	274 04.5	178 49.4 19.2	151 15.3 11.1	145 34.6 18.2	51 16.9 58.2	269 14.0 121 7 42.4 +128						
24	289 07.0	193 48.5 +23 19.2	166 16.0 +21 10.8	160 36.5 +19 18.1	66 19.4 -13 58.2	283 45.1 121 + 7 55.2 +128						
code	-	- 8 + 1	+ 8 - 3	+ 19 - 1	+ 25 0							

G M T	SUN		STARS				Lat.	Sunrise	Twit. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS			
	GHA	Dec.	No.	Name	SHA	Dec.				9	10	11	12	Alt.	Sun's Low'r Limb	Venus	Mars
0	178 46.3	+22 28.9	7	Acamar	315 51.4	-40 28.6	72			22 10	21 50	21 28	21 01				
1	193 46.2	28.7	5	Achernar	335 59.0	-57 27.3	70			22 06	21 52	21 38	21 22				
2	208 46.1	28.4	30	Acrux	173 58.1	-62 51.6	68			22 03	21 55	21 47	21 38				
3	223 46.0	28.1	19	Adhara	255 47.0	-28 54.6	66	1 08	0	22 00	21 57	21 54	21 51				
4	238 45.9	27.8	10	Aldebaran	291 39.5	+16 25.3	64	1 59	0	21 57	21 59	22 00	22 02				
5	253 45.8	27.5					62	2 30	0	21 55	22 00	22 05	22 12				
6	268 45.7	+22 27.2	32	Alioth	166 58.7	+56 12.3	60	2 53	0	21 54	22 01	22 10	22 20				
7	283 45.6	26.9	34	Alkaid	153 32.9	+49 32.3	58	3 11	0	21 52	22 03	22 14	22 27				
8	298 45.5	26.7	55	Al Na'ir	28 37.7	-47 10.3	56	3 27	0	21 51	22 04	22 17	22 34				
9	313 45.4	26.4	15	Alnilam	276 30.7	-1 13.7	54	3 40	0	21 49	22 05	22 21	22 39				
10	328 45.3	26.1	25	Alphard	218 39.0	-8 28.0	52	3 51	0	21 48	22 05	22 24	22 45				
11	343 45.3	25.8					50	4 01	0	21 47	22 06	22 26	22 49				
12	358 45.2	+22 25.5	41	Alphecca	126 47.5	+26 51.9	45	4 22	1 56	21 45	22 08	22 32	23 00	Moon's Lower Limb			
13	13 45.1	25.2	1	Alpheratz	358 28.4	+28 50.7	40	4 39	2 39	21 43	22 09	22 37	23 08	Add			
14	28 45.0	24.9	51	Altair	62 50.2	+8 45.1	35	4 54	3 08	21 41	22 11	22 42	23 15	Alt.	9	10	11
15	43 44.9	24.6	2	Ankaa	353 58.3	-42 32.5	30	5 06	3 31	21 39	22 12	22 45	23 22	0			
16	58 44.8	24.3	42	Antares	113 19.2	-26 20.2	20	5 27	4 04	21 37	22 14	22 52	23 33	4	14.5	15.3	16.1
17	73 44.7	24.0					10	5 45	4 28	21 34	22 15	22 58	23 43	8	14.5	15.3	16.1
18	88 44.6	+22 23.7	37	Arcturus	146 35.2	+19 24.9	0	6 02	4 46	21 32	22 17	23 04	23 53	12	14.6	15.3	16.0
19	103 44.5	23.4	43	Atria	108 59.6	-68 57.1	10	6 18	5 03	21 30	22 19	23 09	24 02	16	14.6	15.3	16.0
20	118 44.4	23.1	22	Avior	234 36.5	-59 22.1	20	6 36	5 18	21 28	22 21	23 16	24 13	20	14.6	15.3	16.0
21	133 44.3	22.8	13	Bellatrix	279 18.9	+6 18.7	30	6 56	5 31	21 25	22 23	23 23	24 25	24	14.6	15.3	16.0
22	148 44.2	22.6	16	Betelge'se	271 48.6	+7 24.0	35	7 07	5 38	21 23	22 24	23 27	24 32	28	14.6	15.3	16.0
23	163 44.1	22.3					40	7 21	5 44	21 22	22 26	23 31	24 39	32	14.6	15.3	16.0
0	178 44.0	+22 22.0	17	Canopus	264 16.0	-52 40.2	45	7 37	5 51	21 20	22 27	23 37	24 49	36	14.7	15.3	16.0
1	193 43.9	21.7	12	Capella	281 39.0	+45 57.2	50	7 56	5 59	21 17	22 29	23 43	25 00	40	14.7	15.3	16.0
2	208 43.9	21.4	53	Deneb	50 00.7	+45 07.3	52	8 05	6 02	21 16	22 30	23 46	25 05	44	14.7	15.3	16.0
3	223 43.8	21.1	28	Denebola	183 18.0	+14 49.2	54	8 15	6 05	21 15	22 31	23 50	25 11	48	14.8	15.4	15.9
4	238 43.7	20.8	4	Diphda	349 39.3	-18 13.6	56	8 27	6 08	21 14	22 32	23 53	25 17	52	14.8	15.4	15.9
5	253 43.6	20.4	27	Dubhe	194 45.1	+61 59.6	58	8 41	6 12	21 12	22 34	23 57	25 24	56	14.9	15.4	15.9
6	268 43.5	+22 20.1	14	Elnath	279 07.8	+28 34.3	50	8 56	6 16	21 11	22 35	24 02	0 02	60	14.9	15.4	15.9
7	283 43.4	19.8	47	Eltanin	91 05.8	+51 29.7	S							64	15.0	15.4	15.8
8	298 43.3	19.5	54	Enif	34 29.5	+9 40.3								68	15.0	15.4	15.8
9	313 43.2	19.2	56	Fomalhaut	16 11.5	-29 51.2								72	15.1	15.4	15.8
10	328 43.1	18.9					N	h	m	h	m	h	m	h	m	h	m
11	343 43.0	18.6	31	Gacrux	172 49.5	-56 52.2	72			7 51	9 48	11 46	13 54	76	15.2	15.5	15.7
12	358 42.9	+22 18.3	29	Gienah	176 37.1	-17 17.9	70			8 00	9 48	11 39	13 36	80	15.2	15.5	15.7
13	13 42.8	18.0	35	Hadar	149 49.5	-60 09.9	68			8 08	9 49	11 32	13 21	84	15.3	15.5	15.7
14	28 42.8	17.7	6	Hamal	328 49.9	+23 15.2	66	22 58	0	8 14	9 49	11 27	13 09	88	15.3	15.5	15.7
15	43 42.7	17.4	48	Kaus Aust.	84 40.9	-34 24.4	64	22 09	0	8 19	9 50	11 23	13 00	90			
16	58 42.6	17.1					62	21 39	0	8 23	9 50	11 19	12 51		Add to table, back cover		
17	73 42.5	16.8	40	Kochab	137 17.3	+74 20.5	60	21 16	0	8 27	9 50	11 16	12 44		Moon's Upper Limb		
18	88 42.4	+22 16.5	57	Markab	14 21.4	+14 58.0	58	20 58	0	8 30	9 51	11 13	12 38		Subtract		
19	103 42.3	16.1	8	Menkar	315 00.6	+3 55.1	56	20 43	0	8 33	9 51	11 10	12 33	Alt.	9	10	11
20	118 42.2	15.8	36	Menkent	148 58.7	-36 09.4	54	20 30	0	8 36	9 51	11 08	12 28	0			
21	133 42.1	15.5	24	Miap'ldus	221 49.9	-69 32.3	52	20 18	0	8 38	9 51	11 06	12 23	4	16.1	15.7	15.3
22	148 42.0	15.2					50	20 08	0	8 40	9 52	11 04	12 19	8	16.1	15.7	15.3
23	163 42.0	14.9	9	Mirfak	309 42.9	+49 42.2	45	19 47	22 12	8 45	9 52	11 00	12 11	12	16.1	15.7	15.3
0	178 41.9	+22 14.6	50	Nunki	76 51.7	-26 21.2	40	19 31	21 30	8 49	9 52	10 57	12 03	16	16.1	15.7	15.3
1	193 41.8	14.3	52	Peacock	54 26.9	-56 52.6	35	19 16	21 01	8 52	9 52	10 54	11 57	20	16.1	15.7	15.3
2	208 41.7	13.9	21	Pollux	244 21.1	+28 08.1	30	19 04	20 39	8 55	9 53	10 51	11 52	24	16.1	15.7	15.3
3	223 41.6	13.6	20	Procyon	245 45.5	+5 20.4	20	18 43	20 06	9 00	9 53	10 47	11 43	28	16.1	15.7	15.3
4	238 41.5	13.3					10	18 25	19 42	9 05	9 53	10 43	11 34	32	16.1	15.7	15.3
5	253 41.4	13.0	46	R'alhague	96 46.4	+12 35.5	0	18 09	19 23	9 09	9 54	10 39	11 27	36	16.0	15.7	15.3
6	268 41.3	+22 12.7	26	Regulus	208 29.9	+12 11.1	10	17 53	19 08	9 13	9 54	10 35	11 19	40	16.0	15.7	15.3
7	283 41.3	12.3	11	Rigel	281 54.1	-8 15.0	20	17 35	18 53	9 17	9 54	10 32	11 11	44	16.0	15.7	15.3
8	298 41.2	12.0	38	Rigel Kent.	140 50.9	-60 39.6	30	17 15	18 40	9 22	9 54	10 27	11 02	48	15.9	15.6	15.4
9	313 41.1	11.7	44	Sabik	103 02.0	-15 40.3	35	17 03	18 33	9 25	9 54	10 24	10 57	52	15.9	15.6	15.4
10	328 41.0	11.4					40	16 50	18 27	9 28	9 55	10 22	10 51	56	15.8	15.6	15.4
11	343 40.9	11.1	3	Schedar	350 30.1	+56 17.5	45	16 34	18 20	9 32	9 55	10 18	10 44	60	15.8	15.6	15.4
12	358 40.8	+22 10.7	45	Shaula	97 20.5	-37 04.4	50	16 15	18 13	9 36	9 55	10 14	10 35	64	15.8	15.6	15.4
13	13 40.7	10.4	18	Sirius	259 12.3	-16 39.2	52	16 06	18 10	9 38	9 55	10 12	10 32	68	15.7	15.6	15.5
14	28 40.6	10.1	33	Spica	159 17.0	-10 55.9	54	15 55	18 06	9 40	9 55	10 10	10 27	72	15.7	15.6	15.5
15	43 40.6	09.8	23	Suhail	223 24.8	-43 15.3	56	15 44	18 03	9 42	9 55	10 08	10 23	76	15.6	15.6	15.5
16	58 40.5	09.4					58	15 30	17 59	9 45	9 55	10 06	10 18	80	15.6	15.6	15.5
17	73 40.4	09.1	49	Vega	81 07.9	+38 44.6	60	15 15	17 56	9 48	9 55	10 03	10 12	84	15.5	15.5	15.6
18	88 40.3	+22 08.8	39	Zub'g'bi	137 53.4	-15 51.6	S							88	15.4	15.5	15.6
19	103 40.2	08.5												90	15.3	15.5	15.7
20	118 40.1	08.1	G	Equation of Time (App.—Mean)				GMT of Transit									
21	133 40.1	07.8	M					Meridian of Greenwich									
22	148 40.0	07.5	T					DAY	Moon	Venus	Mars	Jupiter	Saturn	Subtract from table, back cover			
23	163 39.9	07.1	h	m	s	m	s	h	m	h	m	h	m	h	m		
			0	-	4 54.6	-	5 03.7	-	5 12.4	9	2 58	11 01	12 58	13 25	19 43		
			6	-	4 56.9	-	5 05.9	-	5 14.5	10	3 43	11 03	12 57	13 22	19 39		
			12	-	4 59.2	-	5 08.1	-	5 16.5	11	4 28	11 04	12 56	13 19	19 35		
			18	-	5 01.4	-	5 10.2	-	5 18.6	12	5 15	11 05	12 54	13 16	19 32		
			24	-	5 03.7	-	5 12.4	-	5 20.6								
24	178 39.8	+22 06.8															

G M T	VENUS - 3.3		MARS 2.0		JUPITER - 1.3		SATURN 0.7		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
12 0	289 07.0	193 48.5 +23 19.2	166 16.0 +21 10.8	160 36.5 +19 18.1	66 19.4 -13 58.2	283 45.1 121 + 7 55.2 +128						
1 1	304 09.4	208 47.6 19.2	181 16.8 10.4	175 38.4 18.0	81 21.9 58.2	298 16.2 120 8 08.0 +127						
2 2	319 11.9	223 46.8 19.2	196 17.6 10.1	190 40.3 17.9	96 24.4 58.2	312 47.2 120 8 20.7 +127						
3 3	334 14.4	238 45.9 .. 19.1	211 18.4 .. 09.7	205 42.2 .. 17.7	111 26.9 .. 58.2	327 18.2 118 .. 8 33.4 +127						
4 4	349 16.8	253 45.0 19.1	226 19.2 09.4	220 44.2 17.6	126 29.4 58.2	341 49.0 119 8 46.1 +126						
5 5	4 19.3	268 44.2 19.1	241 20.0 09.0	235 46.1 17.5	141 31.9 58.2	356 19.9 117 8 58.7 +126						
6 6	19 21.8	283 43.3 +23 19.1	256 20.8 +21 08.7	250 48.0 +19 17.3	156 34.4 -13 58.2	10 50.6 117 + 9 11.3 +126						
7 7	34 24.2	298 42.4 19.1	271 21.6 08.3	265 49.9 17.2	171 36.9 58.2	25 21.3 116 9 23.9 +126						
8 8	49 26.7	313 41.6 19.1	286 22.3 08.0	280 51.8 17.1	186 39.4 58.2	39 51.9 115 9 36.5 +125						
9 9	64 29.2	328 40.7 .. 19.0	301 23.1 .. 07.7	295 53.7 .. 16.9	201 41.8 .. 58.2	54 22.4 115 .. 9 49.0 +124						
10 10	79 31.6	343 39.8 19.0	316 23.9 07.3	310 55.6 16.8	216 44.3 58.2	68 52.9 114 10 01.4 +125						
11 11	94 34.1	358 39.0 19.0	331 24.7 07.0	325 57.5 16.7	231 46.8 58.2	83 23.3 113 10 13.9 +123						
12 12	109 36.6	13 38.1 +23 19.0	346 25.5 +21 06.6	340 59.4 +19 16.5	246 49.3 -13 58.2	97 53.6 112 +10 26.2 +124						
13 13	124 39.0	28 37.2 19.0	1 26.3 06.3	356 01.3 16.4	261 51.8 58.2	112 23.8 112 10 38.6 +123						
14 14	139 41.5	43 36.4 18.9	16 27.1 05.9	11 03.3 16.3	276 54.3 58.2	126 54.0 111 10 50.9 +123						
15 15	154 43.9	58 35.5 .. 18.9	31 27.9 .. 05.6	26 05.2 .. 16.1	291 56.8 .. 58.2	141 24.1 110 .. 11 03.2 +122						
16 16	169 46.4	73 34.6 18.9	46 28.6 05.2	41 07.1 16.0	306 59.3 58.2	155 54.1 109 11 15.4 +121						
17 17	184 48.9	88 33.8 18.8	61 29.4 04.9	56 09.0 15.9	322 01.8 58.2	170 24.0 109 11 27.5 +122						
18 18	199 51.3	103 32.9 +23 18.8	76 30.2 +21 04.5	71 10.9 +19 15.7	337 04.3 -13 58.2	184 53.9 107 +11 39.7 +120						
19 19	214 53.8	118 32.0 18.8	91 31.0 04.2	86 12.8 15.6	352 06.8 58.2	199 23.6 107 11 51.7 +120						
20 20	229 56.3	133 31.2 18.8	106 31.8 03.8	101 14.7 15.5	7 09.3 58.2	213 53.3 106 12 03.7 +120						
21 21	244 58.7	148 30.3 .. 18.7	121 32.6 .. 03.5	116 16.6 .. 15.4	22 11.8 .. 58.2	228 22.9 106 .. 12 15.7 +119						
22 22	260 01.2	163 29.4 18.7	136 33.4 03.1	131 18.5 15.2	37 14.3 58.2	242 52.5 104 12 27.6 +119						
23 23	275 03.7	178 28.6 18.7	151 34.2 02.8	146 20.4 15.1	52 16.8 58.2	257 21.9 104 12 39.5 +118						
13 0	290 06.1	193 27.7 +23 18.6	166 35.0 +21 02.5	161 22.3 +19 15.0	67 19.3 -13 58.2	271 51.3 103 +12 51.3 +117						
1 1	305 08.6	208 26.8 18.6	181 35.8 02.1	176 24.3 14.8	82 21.7 58.2	286 20.6 101 13 03.0 +117						
2 2	320 11.1	223 26.0 18.5	196 36.5 01.8	191 26.2 14.7	97 24.2 58.2	300 49.7 101 13 14.7 +116						
3 3	335 13.5	238 25.1 .. 18.5	211 37.3 .. 01.4	206 28.1 .. 14.6	112 26.7 .. 58.2	315 18.8 101 .. 13 26.3 +116						
4 4	350 16.0	253 24.2 18.5	226 38.1 01.1	221 30.0 14.4	127 29.2 58.2	329 47.9 99 13 37.9 +115						
5 5	5 18.4	268 23.4 18.4	241 38.9 00.7	236 31.9 14.3	142 31.7 58.2	344 16.8 98 13 49.4 +114						
6 6	20 20.9	283 22.5 +23 18.4	256 39.7 +21 00.4	251 33.8 +19 14.2	157 34.2 -13 58.2	358 45.6 98 +14 00.8 +114						
7 7	35 23.4	298 21.6 18.3	271 40.5 21 00.0	266 35.7 14.0	172 36.7 58.2	13 14.4 96 14 12.2 +113						
8 8	50 25.8	313 20.8 18.3	286 41.3 20 59.6	281 37.6 13.9	187 39.2 58.2	27 43.0 96 14 23.5 +113						
9 9	65 28.3	328 19.9 .. 18.2	301 42.1 .. 59.3	296 39.5 .. 13.8	202 41.7 .. 58.2	42 11.6 95 .. 14 34.8 +111						
10 10	80 30.8	343 19.0 18.2	316 42.9 58.9	311 41.4 13.6	217 44.2 58.2	56 40.1 93 14 45.9 +111						
11 11	95 33.2	358 18.2 18.1	331 43.7 58.6	326 43.3 13.5	232 46.7 58.2	71 08.4 93 14 57.0 +110						
12 12	110 35.7	13 17.3 +23 18.1	346 44.5 +20 58.2	341 45.3 +19 13.4	247 49.2 -13 58.3	85 36.7 92 +15 08.0 +110						
13 13	125 38.2	28 16.4 18.0	1 45.2 57.9	356 47.2 13.2	262 51.6 58.3	100 04.9 91 15 19.0 +108						
14 14	140 40.6	43 15.6 18.0	16 46.0 57.5	11 49.1 13.1	277 54.1 58.3	114 33.0 90 15 29.8 +108						
15 15	155 43.1	58 14.7 .. 17.9	31 46.8 .. 57.2	26 51.0 .. 13.0	292 56.6 .. 58.3	129 01.0 90 .. 15 40.6 +107						
16 16	170 45.5	73 13.8 17.9	46 47.6 56.8	41 52.9 12.8	307 59.1 58.3	143 29.0 88 15 51.3 +107						
17 17	185 48.0	88 13.0 17.8	61 48.4 56.5	56 54.8 12.7	323 01.6 58.3	157 56.8 87 16 02.0 +105						
18 18	200 50.5	103 12.1 +23 17.7	76 49.2 +20 56.1	71 56.7 +19 12.6	338 04.1 -13 58.3	172 24.5 86 +16 12.5 +105						
19 19	215 52.9	118 11.2 17.7	91 50.0 55.8	86 58.6 12.4	353 06.6 58.3	186 52.1 85 16 23.0 +104						
20 20	230 55.4	133 10.4 17.6	106 50.8 55.4	102 00.5 12.3	8 09.1 58.3	201 19.6 85 16 33.4 +103						
21 21	245 57.9	148 09.5 .. 17.6	121 51.6 .. 55.1	117 02.4 .. 12.2	23 11.6 .. 58.3	215 47.1 83 .. 16 43.7 +102						
22 22	261 00.3	163 08.6 17.5	136 52.4 54.7	132 04.3 12.0	38 14.1 58.3	230 14.4 82 16 53.9 +101						
23 23	276 02.8	178 07.8 17.4	151 53.2 54.4	147 06.3 11.9	53 16.5 58.3	244 41.6 82 17 04.0 +100						
14 0	291 05.3	193 06.9 +23 17.4	166 54.0 +20 54.0	162 08.2 +19 11.8	68 19.0 -13 58.3	259 08.8 80 +17 14.0 + 99						
1 1	306 07.7	208 06.0 17.3	181 54.8 53.6	177 10.1 11.6	83 21.5 58.3	273 35.8 79 17 23.9 + 99						
2 2	321 10.2	223 05.2 17.2	196 55.6 53.3	192 12.0 11.5	98 24.0 58.3	288 02.7 79 17 33.8 + 97						
3 3	336 12.7	238 04.3 .. 17.2	211 56.3 .. 52.9	207 13.9 .. 11.4	113 26.5 .. 58.3	302 29.6 77 .. 17 43.5 + 96						
4 4	351 15.1	253 03.4 17.1	226 57.1 52.6	222 15.8 11.2	128 29.0 58.3	316 56.3 77 17 53.1 + 96						
5 5	6 17.6	268 02.6 17.0	241 57.9 52.2	237 17.7 11.1	143 31.5 58.3	331 23.0 75 18 02.7 + 94						
6 6	21 20.0	283 01.7 +23 17.0	256 58.7 +20 51.9	252 19.6 +19 11.0	158 34.0 -13 58.3	345 49.5 74 +18 12.1 + 94						
7 7	36 22.5	298 00.8 16.9	271 59.5 51.5	267 21.5 10.8	173 36.5 58.3	0 15.9 74 18 21.5 + 92						
8 8	51 25.0	313 00.0 16.8	287 00.3 51.1	282 23.4 10.7	188 38.9 58.3	14 42.3 72 18 30.7 + 91						
9 9	66 27.4	327 59.1 .. 16.7	302 01.1 .. 50.8	297 25.3 .. 10.6	203 41.4 .. 58.3	29 08.5 72 .. 18 39.8 + 90						
10 10	81 29.9	342 58.2 16.7	317 01.9 50.4	312 27.2 10.4	218 43.9 58.3	43 34.7 70 18 48.8 + 90						
11 11	96 32.4	357 57.4 16.6	332 02.7 50.1	327 29.2 10.3	233 46.4 58.3	58 00.7 69 18 57.8 + 88						
12 12	111 34.8	12 56.5 +23 16.5	347 03.5 +20 49.7	342 31.1 +19 10.2	248 48.9 -13 58.3	72 26.6 69 +19 06.6 + 86						
13 13	126 37.3	27 55.6 16.4	2 04.3 49.4	357 33.0 10.0	263 51.4 58.4	86 52.5 67 19 15.2 + 86						
14 14	141 39.8	42 54.8 16.3	17 05.1 49.0	12 34.9 09.9	278 53.9 58.4	101 18.2 67 19 23.8 + 85						
15 15	156 42.2	57 53.9 .. 16.2	32 05.9 .. 48.6	27 36.8 .. 09.8	293 56.3 .. 58.4	115 43.9 65 .. 19 32.3 + 83						
16 16	171 44.7	72 53.0 16.2	47 06.7 48.3	42 38.7 09.6	308 58.8 58.4	130 09.4 65 19 40.6 + 83						
17 17	186 47.2	87 52.2 16.1	62 07.5 47.9	57 40.6 09.5	324 01.3 58.4	144 34.9 63 19 48.9 + 81						
18 18	201 49.6	102 51.3 +23 16.0	77 08.3 +20 47.6	72 42.5 +19 09.4	339 03.8 -13 58.4	159 00.2 63 +19 57.0 + 79						
19 19	216 52.1	117 50.5 15.9	92 09.1 47.2	87 44.4 09.2	354 06.3 58.4	173 25.5 61 20 04.9 + 79						
20 20	231 54.5	132 49.6 15.8	107 09.9 46.8	102 46.3 09.1	9 08.8 58.4	187 50.6 61 20 12.8 + 77						
21 21	246 57.0	147 48.7 .. 15.7	122 10.7 .. 46.5	117 48.2 .. 09.0	24 11.3 .. 58.4	202 15.7 60 .. 20 20.5 + 77						
22 22	261 59.5	162 47.9 15.6	137 11.5 46.1	132 50.1 08.8	39 13.7 58.4	216 40.7 58 20 28.2 + 74						
23 23	277 01.9	177 47.0 15.5	152 12.3 45.8	147 52.1 08.7	54 16.2 58.4	231 05.5 58 20 35.6 + 74						
24 24	292 04.4	192 46.1 +23 15.4	167 13.1 +20 45.4	162 54.0 +19 08.6	69 18.7 -13 58.4	245 30.3 57 +20 43.0 + 72						
code	-	- 9 - 1	+ 7 - 3	+ 19 - 2	+ 24							

G M T	SUN			STARS			Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.	No.	Name	SHA	Dec.								Alt.	Sun's Low'r Limb	Venus	Mars		
										12	13	14	15						
h	°	'	°	°	'	°	N	h	m	h	m	h	m	h	m	°	'	'	'
12	0	178 39.8	+22 06.8	7	Acamar	315 51.4	-40 28.6	72	□	□	21 01	20 14	□	□	□	0			
	1	193 39.7	06.5	5	Achernar	335 59.0	-57 27.3	70	□	□	21 22	20 58	□	□	□	30	0.1	0.1	0.1
	2	208 39.6	06.1	30	Acruz	173 58.1	-62 51.6	68	□	□	21 38	21 27	21 09	□	□	45	0.1	0.1	0.0
	3	223 39.6	05.8	19	Adhara	255 47.0	-28 54.6	66	1 23	////	21 51	21 49	21 48	21 53	□	60	0.1	0.0	0.0
	4	238 39.5	05.5	10	Aldebaran	291 39.5	+16 25.3	64	2 07	////	22 02	22 07	22 16	22 37	0	75	0.1	0.0	0.0
	5	253 39.4	05.1					62	2 36	////	22 12	22 22	22 37	23 06	30	90			
	6	268 39.3	+22 04.8	32	Alioth	166 58.7	+56 12.2	60	2 58	////	22 20	22 34	22 55	23 29	45				
	7	283 39.2	04.5	34	Alkaid	153 32.9	+49 32.3	58	3 16	////	22 27	22 45	23 10	23 47	60				
	8	298 39.1	04.1	55	Al Na'ir	28 37.7	-47 10.3	56	3 31	////	22 34	22 54	23 22	24 02	75				
	9	313 39.1	03.8	15	Alnilam	276 30.7	-1 13.7	54	3 43	////	22 39	23 03	23 33	24 15	90				
	10	328 39.0	03.5	25	Alphard	218 39.0	-8 28.0	52	3 55	////	22 45	23 10	23 43	24 27					
	11	343 38.9	03.1					50	4 04	0 14	22 49	23 17	23 52	24 38	Moon's Lower Limb				
	12	358 38.8	+22 02.8	41	Alphecca	126 47.5	+26 51.9	45	4 25	2 01	23 00	23 31	24 10	0 10	Add				
	13	13 38.7	02.4	1	Alpheratz	358 28.3	+28 50.7	40	4 42	2 42	23 08	23 44	24 26	0 26	Alt.	12	13	14	
	14	28 38.6	02.1	51	Altair	62 50.2	+8 45.1	35	4 55	3 11	23 15	23 54	24 39	0 39	°	'	'	'	
	15	43 38.6	01.8	2	Ankaa	353 58.3	-42 32.5	30	5 07	3 32	23 22	24 03	0 03	0 50	0	16.9	17.8	18.7	
	16	58 38.5	01.4	42	Antares	113 19.2	-26 20.2	20	5 28	4 05	23 33	24 19	0 19	1 10	4	16.9	17.8	18.7	
	17	73 38.4	01.1					10	5 46	4 28	23 43	24 33	0 33	1 27	8	16.9	17.8	18.7	
	18	88 38.3	+22 00.7	37	Arcturus	146 35.2	+19 24.9	0	6 02	4 48	23 53	24 46	0 46	1 43	12	16.9	17.8	18.7	
	19	103 38.2	00.4	43	Atria	108 59.6	-68 57.1	10	6 18	5 03	24 02	0 02	0 59	1 59	16	16.9	17.8	18.7	
	20	118 38.2	22 00.0	22	Avior	234 36.5	-59 22.1	20	6 35	5 18	24 13	0 13	1 13	2 16	20	16.9	17.8	18.6	
	21	133 38.1	-21 59.7	13	Bellatrix	279 18.9	+6 18.7	30	6 55	5 30	24 25	0 25	1 29	2 36	24	16.9	17.7	18.6	
	22	148 38.0	59.4	16	Betelge'se	271 48.6	+7 24.0	35	7 07	5 37	24 32	0 32	1 39	2 48	28	16.8	17.7	18.5	
	23	163 37.9	59.0					40	7 20	5 44	24 39	0 39	1 50	3 02	32	16.8	17.6	18.4	
				17	Canopus	264 16.0	-52 40.2	45	7 35	5 51	24 49	0 49	2 03	3 18	36	16.8	17.5	18.3	
				12	Capella	281 39.0	+45 57.2	50	7 54	5 58	25 00	1 00	2 19	3 38	40	16.7	17.5	18.2	
				53	Deneb	50 00.6	+45 07.3	52	8 03	6 01	25 05	1 05	2 26	3 47	44	16.7	17.4	18.1	
				28	Denebola	183 18.0	+14 49.3	54	8 13	6 04	25 11	1 11	2 34	3 58	48	16.6	17.3	18.0	
				4	Diphda	349 39.3	-18 13.6	56	8 24	6 06	25 17	1 17	2 44	4 10	52	16.6	17.2	17.8	
								58	8 37	6 10	25 24	1 24	2 54	4 24	56	16.5	17.1	17.7	
				27	Dubhe	194 45.1	+61 59.6	60	8 53	6 14	0 02	1 33	3 07	4 40	60	16.4	17.0	17.6	
				14	Elnath	279 07.8	+28 34.3	S							64	16.4	16.9	17.4	
				47	Eltanin	91 05.8	+51 29.7		Lat.	Sunset	Twlt. ends	Moonset				68	16.3	16.8	17.2
				54	Enif	34 29.4	+9 40.3		N.	h m	h m	12	13	14	15	72	16.2	16.7	17.1
				56	Fomalhaut	16 11.5	-29 51.2			h m	h m	h m	h m	h m	h m	76	16.2	16.5	16.9
	10	328 37.1	55.2					72	□	□	13 54	16 29	□	□	80	16.1	16.4	16.8	
	11	343 37.0	54.8	31	Gacrux	172 49.5	-56 52.2	70	□	□	13 36	15 47	□	□	84	16.0	16.3	16.6	
	12	358 36.9	+21 54.5	29	Gienah	176 37.1	-17 17.9	68	□	□	13 21	15 19	17 33	□	88	15.9	16.2	16.4	
	13	13 36.8	54.1	35	Hadar	149 49.5	-60 09.9	66	22 45	////	13 09	14 58	16 55	18 56	90	15.9	16.1	16.3	
	14	28 36.8	53.7	6	Hamal	328 49.9	+23 15.2	64	22 02	////	13 00	14 42	16 28	18 12	Add to table, back cover				
	15	43 36.7	53.4	48	Kaus Aust.	84 40.9	-34 24.4	62	21 33	////	12 51	14 28	16 07	17 43	Moon's Upper Limb				
	16	58 36.6	53.0					60	21 12	////	12 44	14 16	15 50	17 21	Subtract				
	17	73 36.5	52.7	40	Kochab	137 17.4	+74 20.5	58	20 54	////	12 38	14 06	15 36	17 03	Alt.	12	13	14	
	18	88 36.4	+21 52.3	57	Markab	14 21.4	+14 58.0	56	20 40	////	12 33	13 58	15 24	16 48	0	14.8	14.2	13.7	
	19	103 36.4	51.9	8	Menkar	315 00.6	+3 55.1	54	20 27	////	12 28	13 50	15 14	16 35	4	14.8	14.3	13.8	
	20	118 36.3	51.6	36	Menkent	148 58.7	-36 09.4	52	20 16	////	12 23	13 43	15 04	16 23	8	14.8	14.3	13.8	
	21	133 36.2	51.2	24	Miapl'dus	221 49.9	-69 32.3	50	20 06	23 43	12 19	13 37	14 56	16 13	12	14.8	14.3	13.8	
	22	148 36.1	50.9					45	19 46	22 08	12 11	13 23	14 38	15 52	16	14.8	14.3	13.9	
	23	163 36.1	50.5	9	Mirfak	309 42.8	+49 42.2	40	19 29	21 27	12 03	13 13	14 24	15 35	20	14.8	14.4	13.9	
				50	Nunki	76 51.7	-26 21.2	35	19 15	20 59	11 57	13 03	14 12	15 21	24	14.9	14.4	14.0	
				52	Peacock	54 26.9	-56 52.6	30	19 03	20 37	11 52	12 55	14 01	15 08	28	14.9	14.5	14.1	
				21	Pollux	244 21.1	+28 08.1	20	18 43	20 06	11 43	12 41	13 43	14 47	32	14.9	14.5	14.1	
				20	Procyon	245 45.5	+5 20.4	10	18 26	19 43	11 34	12 29	13 27	14 29	36	14.9	14.5	14.1	
								0	18 09	19 23	11 27	12 18	13 12	14 11	40	14.9	14.5	14.2	
				46	R'alhague	96 46.4	+12 35.5	10	17 53	19 08	11 19	12 06	12 58	13 54	44	15.0	14.6	14.3	
				26	Regulus	208 29.9	+12 11.1	20	17 36	18 54	11 11	11 54	12 42	13 36	48	15.0	14.7	14.4	
				11	Rigel	281 54.0	-8 15.0	30	17 36	18 54	11 11	11 54	12 42	13 36	52	15.1	14.8	14.5	
				38	Rigil Kent.	140 50.9	-60 39.6	30	17 17	18 41	11 02	11 40	12 24	13 14	56	15.1	14.9	14.6	
				44	Sabik	103 02.0	-15 40.3	35	17 05	18 35	10 57	11 32	12 14	13 02	60	15.2	15.0	14.8	
								40	16 52	18 28	10 51	11 23	12 02	12 48	64	15.2	15.1	14.9	
								45	16 37	18 22	10 44	11 13	11 48	12 31	68	15.2	15.1	14.9	
				3	Schedar	350 30.0	+56 17.5	50	16 18	18 15	10 35	11 00	11 31	12 10	72	15.3	15.1	14.9	
				45	Shaula	97 20.5	-37 04.4	50	16 18	18 15	10 35	11 00	11 31	12 10	76	15.3	15.1	14.9	
				18	Sirius	259 12.3	-16 39.2	52	16 09	18 12	10 32	10 54	11 23	12 01	80	15.3	15.2	15.1	
				33	Spica	159 17.0	-10 55.9	54	15 59	18 09	10 27	10 48	11 14	11 50	84	15.4	15.3	15.2	
				23	Suhail	223 24.8	-43 15.3	56	15 47	18 05	10 23	10 41	11 04	11 37	88	15.5	15.4	15.4	

G M T	T GHA	VENUS - 3.4			MARS 2.0			JUPITER - 1.3			SATURN 0.7			MOON			
		GHA	Dec.		GHA	Dec.		GHA	Dec.		GHA	Dec.		GHA	code	Dec.	code
15	0	292 04.4	192 46.1	+23 15.4	167 13.1	+20 45.4		162 54.0	+19 08.6		69 18.7	-13 58.4		245 30.3	57	+20 43.0	+ 72
	1	307 06.9	207 45.3	15.3	182 13.8	45.0		177 55.9	08.4		84 21.2	58.4		259 55.0	56	20 50.2	+ 71
	2	322 09.3	222 44.4	15.3	197 14.6	44.7		192 57.8	08.3		99 23.7	58.4		274 19.6	55	20 57.3	+ 70
	3	337 11.8	237 43.5	15.2	212 15.4	44.3		207 59.7	08.2		114 26.2	58.4		288 44.1	54	-21 04.3	+ 68
	4	352 14.3	252 42.7	15.1	227 16.2	44.0		223 01.6	08.0		129 28.7	58.4		303 08.5	53	-21 11.1	+ 67
	5	7 16.7	267 41.8	15.0	242 17.0	43.6		238 03.5	07.9		144 31.1	58.4		317 32.8	52	-21 17.8	+ 65
	6	22 19.2	282 40.9	+23 14.9	257 17.8	+20 43.2		253 05.4	+19 07.8		159 33.6	-13 58.4		331 57.0	52	+21 24.3	+ 64
	7	37 21.7	297 40.1	14.8	272 18.6	42.9		268 07.3	07.6		174 36.1	58.4		346 21.2	50	-21 30.7	+ 63
	8	52 24.1	312 39.2	14.7	287 19.4	42.5		283 09.2	07.5		189 38.6	58.4		0 45.2	50	-21 37.0	+ 61
	9	67 26.6	327 38.3	14.5	302 20.2	42.1		298 11.1	07.4		204 41.1	58.5		15 09.2	49	-21 43.1	+ 60
	10	82 29.0	342 37.5	14.4	317 21.0	41.8		313 13.0	07.2		219 43.6	58.5		29 33.1	48	-21 49.1	+ 59
	11	97 31.5	357 36.6	14.3	332 21.8	41.4		328 14.9	07.1		234 46.0	58.5		43 56.9	47	-21 55.0	+ 56
	12	112 34.0	12 35.7	+23 14.2	347 22.6	+20 41.0		343 16.9	+19 07.0		249 48.5	-13 58.5		58 20.6	46	+22 00.6	+ 56
	13	127 36.4	27 34.9	14.1	2 23.4	40.7		358 18.8	06.8		264 51.0	58.5		72 44.2	46	+22 06.2	+ 54
	14	142 38.9	42 34.0	14.0	17 24.2	40.3		13 20.7	06.7		279 53.5	58.5		87 07.8	44	+22 11.6	+ 52
	15	157 41.4	57 33.1	13.9	32 25.0	40.0		28 22.6	06.6		294 56.0	58.5		101 31.2	44	+22 16.8	+ 51
	16	172 43.8	72 32.3	13.8	47 25.8	39.6		43 24.5	06.4		309 58.5	58.5		115 54.6	43	+22 21.9	+ 50
	17	187 46.3	87 31.4	13.7	62 26.6	39.2		58 26.4	06.3		325 00.9	58.5		130 17.9	43	+22 26.9	+ 47
	18	202 48.8	102 30.5	+23 13.6	77 27.4	+20 38.9		73 28.3	+19 06.2		340 03.4	-13 58.5		144 41.2	42	+22 31.6	+ 47
	19	217 51.2	117 29.7	13.4	92 28.2	38.5		88 30.2	06.0		355 05.9	58.5		159 04.4	40	+22 36.3	+ 45
	20	232 53.7	132 28.8	13.3	107 29.0	38.1		103 32.1	05.9		10 08.4	58.5		173 27.4	41	+22 40.8	+ 43
	21	247 56.2	147 27.9	13.2	122 29.8	37.8		118 34.0	05.8		25 10.9	58.5		187 50.5	39	+22 45.1	+ 41
	22	262 58.6	162 27.1	13.1	137 30.6	37.4		133 35.9	05.6		40 13.3	58.5		202 13.3	39	+22 49.2	+ 40
	23	278 01.1	177 26.2	13.0	152 31.4	37.0		148 37.8	05.5		55 15.8	58.5		216 36.4	38	+22 53.2	+ 39
16	0	293 03.5	192 25.3	+23 12.8	167 32.2	+20 36.7		163 39.7	+19 05.4		70 18.3	-13 58.5		230 59.1	38	+22 57.1	+ 37
	1	308 06.0	207 24.5	12.7	182 33.0	36.3		178 41.7	05.2		85 20.8	58.6		245 21.9	37	+23 00.8	+ 35
	2	323 08.5	222 23.6	12.6	197 33.8	35.9		193 43.6	05.1		100 23.3	58.6		259 44.6	36	+23 04.3	+ 33
	3	338 10.9	237 22.8	12.5	212 34.6	35.6		208 45.5	04.9		115 25.7	58.6		274 07.2	36	+23 07.6	+ 32
	4	353 13.4	252 21.9	12.3	227 35.4	35.2		223 47.4	04.8		130 28.2	58.6		288 29.8	36	+23 10.8	+ 30
	5	8 15.9	267 21.0	12.2	242 36.2	34.8		238 49.3	04.7		145 30.7	58.6		302 52.4	34	+23 13.8	+ 29
	6	23 18.3	282 20.2	+23 12.1	257 37.0	+20 34.4		253 51.2	+19 04.5		160 33.2	-13 58.6		317 14.8	34	+23 16.7	+ 27
	7	38 20.8	297 19.3	11.9	272 37.8	34.1		268 53.1	04.4		175 35.7	58.6		331 37.2	34	+23 19.4	+ 25
	8	53 23.3	312 18.4	11.8	287 38.6	33.7		283 55.0	04.3		190 38.1	58.6		345 59.6	33	+23 21.9	+ 23
	9	68 25.7	327 17.6	11.7	302 39.4	33.3		298 56.9	04.1		205 40.6	58.6		0 21.9	33	+23 24.2	+ 22
	10	83 28.2	342 16.7	11.5	317 40.2	33.0		313 58.8	04.0		220 43.1	58.6		14 44.2	32	+23 26.4	+ 20
	11	98 30.6	357 15.8	11.4	332 41.0	32.6		329 00.7	03.9		235 45.6	58.6		29 06.4	32	+23 28.4	+ 19
	12	113 33.1	12 15.0	+23 11.3	347 41.8	+20 32.2		344 02.6	+19 03.7		250 48.1	-13 58.6		43 28.6	32	+23 30.3	+ 16
	13	128 35.6	27 14.1	11.1	2 42.6	31.9		359 04.5	03.6		265 50.5	58.6		57 50.8	31	+23 31.9	+ 15
	14	143 38.0	42 13.2	11.0	17 43.4	31.5		14 06.4	03.5		280 53.0	58.6		72 12.9	31	+23 33.4	+ 14
	15	158 40.5	57 12.4	10.9	32 44.3	31.1		29 08.4	03.3		295 55.5	58.7		86 35.0	30	+23 34.8	+ 11
	16	173 43.0	72 11.5	10.7	47 45.1	30.7		44 10.3	03.2		310 58.0	58.7		100 57.0	31	+23 35.9	+ 10
	17	188 45.4	87 10.7	10.6	62 45.9	30.4		59 12.2	03.1		326 00.5	58.7		115 19.1	29	+23 36.9	+ 8
	18	203 47.9	102 09.8	+23 10.4	77 46.7	+20 30.0		74 14.1	+19 02.9		341 02.9	-13 58.7		129 41.0	30	+23 37.7	+ 6
	19	218 50.4	117 08.9	10.3	92 47.5	29.6		89 16.0	02.8		356 05.4	58.7		144 03.0	29	+23 38.3	+ 5
	20	233 52.8	132 08.1	10.1	107 48.3	29.3		104 17.9	02.7		11 07.9	58.7		158 24.9	30	+23 38.8	+ 3
	21	248 55.3	147 07.2	10.0	122 49.1	28.9		119 19.8	02.5		26 10.4	58.7		172 46.9	29	+23 39.1	+ 1
	22	263 57.8	162 06.3	09.8	137 49.9	28.5		134 21.7	02.4		41 12.8	58.7		187 08.8	29	+23 39.2	- 1
	23	279 00.2	177 05.5	09.7	152 50.7	28.1		149 23.6	02.2		56 15.3	58.7		201 30.7	28	+23 39.1	- 3
17	0	294 02.7	192 04.6	+23 09.5	167 51.5	+20 27.8		164 25.5	+19 02.1		71 17.8	-13 58.7		215 52.5	29	+23 38.8	- 4
	1	309 05.1	207 03.7	09.4	182 52.3	27.4		179 27.4	02.0		86 20.3	58.7		230 14.4	28	+23 38.4	- 6
	2	324 07.6	222 02.9	09.2	197 53.1	27.0		194 29.3	01.8		101 22.8	58.7		244 36.2	29	+23 37.8	- 8
	3	339 10.1	237 02.0	09.1	212 53.9	26.6		209 31.2	01.7		116 25.2	58.7		258 58.1	28	+23 37.0	- 9
	4	354 12.5	252 01.2	08.9	227 54.7	26.3		224 33.1	01.6		131 27.7	58.7		273 19.9	29	+23 36.1	- 12
	5	9 15.0	267 00.3	08.8	242 55.5	25.9		239 35.1	01.4		146 30.2	58.8		287 41.8	28	+23 34.9	- 13
	6	24 17.5	281 59.4	+23 08.6	257 56.3	+20 25.5		254 37.0	+19 01.3		161 32.7	-13 58.8		302 03.6	28	+23 33.6	- 15
	7	39 19.9	296 58.6	08.4	272 57.1	25.1		269 38.9	01.2		176 35.1	58.8		316 25.4	29	+23 32.1	- 16
	8	54 22.4	311 57.7	08.3	287 57.9	24.8		284 40.8	01.0		191 37.6	58.8		330 47.3	28	+23 30.5	- 18
	9	69 24.9	326 56.8	08.1	302 58.7	24.4		299 42.7	00.9		206 40.1	58.8		345 09.1	29	+23 28.7	- 21
	10	84 27.3	341 56.0	08.0	317 59.5	24.0		314 44.6	00.8		221 42.6	58.8		359 31.0	29	+23 26.6	- 21
	11	99 29.8	356 55.1	07.8	333 00.3	23.6		329 46.5	00.6		236 45.0	58.8		13 52.9	29	+23 24.5	- 24
	12	114 32.3	11 54.3	+23 07.6	348 01.1	+20 23.3		344 48.4	+19 00.5		251 47.5	-13 58.8		28 14.8	29	+23 22.1	- 25
	13	129 34.7	26 53.4	07.5	3 02.0	22.9		359 50.3	00.3		266 50.0	58.8		42 36.7	29	+23 19.6	- 27
	14	144 37.2	41 52.5	07.3	18 02.8	22.5		14 52.2	00.2		281 52.5	58.8		56 58.6	30	+23 16.9	- 29
	15	159 39.6	56 51.7	07.1	33 03.6	22.1		29 54.1	-19 00.1		296 54.9	58.8		71 20.6	30	+23 14.0	- 31
	16	174 42.1	71 50.8	07.0	48 04.4	21.8		44 56.0	18 59.9		311 57.4	58.8		85 42.6	30	+23 10.9	- 32
	17	189 44.6	86 49.9	06.8	63 05.2	21.4		59 57.9	59.8		326 59.9	58.9		100 04.6	30	+23 07.7	- 34
	18	204 47.0	101 49.1	+23 06.6	78 06.0	+20 21.0		74 59.8	+18 59.7		342 02.4	-13 58.9		114 26.6	31	+23 04.3	- 36
	19	219 49.5	116 48.2	06.4	93 06.8	20.6		90 01.7	59.5		357 04.8	58.9		128 48.7	31	+23 00.7	- 37
	20	234 52.0	131 47.4	06.3	108 07.6	20.2		105 03.6	59.4		12 07.3	58.9		143 10.8	31	+22 57.0	- 39
	21	249 54.4	146 46.5	06.1	123 08.4	19.9		120 05.6	59.3		27 09.8	58.9		157 32.9	32	+22 53.1	- 41
	22	264 56.9	161 45.6	05.9	138 09.2	19.5		135 07.5	59.1		42 12.2	58.9		171 55.1	32	+22 49.0	- 43
	23	279 59.4</															

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.	No.	Name	SHA	Dec.													
										15	16	17	18	Alt.	Sun's Low'r Limb Add	Venus Add	Mars Add		
h	°	'			°	'	N	h	m	h	m	h	m	h	m	°	'	'	'
15	0	178 34.3 +21 41.2	7	Acamar	315 51.4 -40 28.6	72	70									0			
	1	193 34.2 40.9	5	Achernar	335 58.9 -57 27.3	70										30	0.1	0.1	0.1
	2	208 34.1 40.5	30	Acrux	173 58.2 -62 51.6	68										45	0.1	0.1	0.0
	3	223 34.0 40.1	19	Adhara	255 47.0 -28 54.6	66	1 36	////	21 53	22 22	24 03	0 03				75	0.1	0.0	0.0
	4	238 34.0 39.7	10	Aldebaran	291 39.5 +16 25.3	64	2 16	////	22 37	23 23	24 48	0 48				90			
	5	253 33.9 39.3				62	2 43	////	23 06	23 57	25 17	1 17							
	6	268 33.8 +21 39.0	32	Alioth	166 58.7 +56 12.2	60	3 04	////	23 29	24 22	0 22	1 40							
	7	283 33.8 38.6	34	Alkaid	153 32.9 +49 32.3	58	3 21	////	23 47	24 42	0 42	1 58							
	8	298 33.7 38.2	55	Al Na'ir	28 37.7 -47 10.3	56	3 35	////	24 02	0 02	0 59	2 13							
	9	313 33.6 37.8	15	Alnilam	276 30.7 -1 13.7	54	3 47	////	24 15	0 15	1 13	2 26							
	10	328 33.6 37.4	25	Alphard	218 39.0 -8 28.0	52	3 58	////	24 27	0 27	1 25	2 38							
	11	343 33.5 37.0				50	4 08	0 42	24 38	0 38	1 36	2 48				Moon's Lower Limb			
	12	358 33.4 +21 36.7	41	Alphecca	126 47.5 +26 51.9	45	4 28	2 06	0 10	0 59	1 59	3 09				Add			
	13	1 33.4 36.3	1	Alpheratz	358 28.3 +28 50.7	40	4 44	2 46	0 26	1 17	2 17	3 26				Alt.	15	16	17
	14	28 33.3 35.9	51	Altair	62 50.2 +8 45.1	35	4 57	3 14	0 39	1 32	2 33	3 41				°	'	'	'
	15	43 33.2 35.5	2	Ankaa	353 58.3 -42 32.5	30	5 09	3 35	0 50	1 44	2 46	3 53				0	19.5	20.0	20.3
	16	58 33.2 35.1	42	Antares	113 19.2 -26 20.2	20	5 29	4 07	1 10	2 06	3 09	4 14				4	19.5	20.0	20.2
	17	73 33.1 34.7				10	5 46	4 30	1 27	2 26	3 28	4 33				8	19.5	20.0	20.2
	18	88 33.0 +21 34.3	37	Arcturus	146 35.2 +19 24.9	0	6 02	4 48	1 43	2 44	3 47	4 50				12	19.4	19.9	20.1
	19	103 33.0 33.9	43	Atria	108 59.6 -68 57.2	10	6 18	5 04	1 59	3 02	4 05	5 07				16	19.3	19.8	20.1
	20	118 32.9 33.5	22	Avior	234 36.5 -59 22.1	20	6 35	5 17	2 16	3 21	4 25	5 26				20	19.3	19.8	20.0
	21	133 32.8 33.2	13	Bellatrix	279 18.8 +6 18.7	30	6 54	5 30	2 36	3 43	4 48	5 47				24	19.2	19.6	19.9
	22	148 32.8 32.8	16	Betelge'se	271 48.6 +7 24.1	35	7 05	5 37	2 48	3 57	5 01	6 00				28	19.1	19.5	19.8
	23	163 32.7 32.4				40	7 18	5 43	3 02	4 12	5 17	6 14				32	19.0	19.4	19.6
			17	Canopus	264 16.0 -52 40.2	45	7 33	5 49	3 18	4 30	5 35	6 31				36	18.8	19.3	19.5
16	0	178 32.6 +21 32.0	12	Capella	281 39.0 +45 57.2	50	7 52	5 55	3 38	4 53	5 58	6 52				40	18.7	19.1	19.3
	1	193 32.6 31.6	53	Deneb	50 00.6 +45 07.3	52	8 00	5 58	3 47	5 03	6 09	7 01				44	18.5	18.9	19.1
	2	208 32.5 31.2	28	Denebola	183 18.0 +14 49.3	54	8 10	6 01	3 58	5 16	6 22	7 13				48	18.4	18.8	18.9
	3	223 32.4 30.8	4	Diphda	349 39.3 -18 13.6	56	8 21	6 04	4 10	5 30	6 36	7 25				52	18.2	18.6	18.7
	4	238 32.4 30.4				58	8 33	6 08	4 24	5 46	6 53	7 40				56	18.0	18.4	18.5
	5	253 32.3 30.0	27	Dubhe	194 45.1 +61 59.6	60	8 48	6 10	4 40	6 06	7 13	7 57				60	17.9	18.1	18.3
	6	268 32.3 +21 29.6	14	Elnath	279 07.8 +28 34.3	S										64	17.7	17.9	18.1
	7	283 32.2 29.2	47	Eltanin	91 05.8 +51 29.8		Lat.	Sunset	Twlt. ends	Moonset				68	17.5	17.7	17.8		
	8	298 32.1 28.8	54	Enif	34 29.4 +9 40.4		N.			15	16	17	18	72	17.2	17.5	17.6		
	9	313 32.1 28.4	56	Fomalhaut	16 11.5 -29 51.2		h m	h m	h m	h m	h m	h m	h m	76	17.0	17.2	17.3		
	10	328 32.0 28.0				70								80	16.8	17.0	17.1		
	11	343 31.9 27.6	31	Gacrux	172 49.5 -56 52.2	72								84	16.6	16.7	16.8		
	12	358 31.9 +21 27.2	29	Gienah	176 37.1 -17 17.9	70								88	16.4	16.6	16.6		
	13	1 31.8 26.8	35	Hadar	149 49.5 -60 09.9	68								90	Add to table, back cover				
	14	28 31.7 26.4	6	Hamal	328 49.8 +23 15.2	66	22 32	////	18 56	20 38	21 10	21 15			Moon's Upper Limb				
	15	43 31.7 26.0	48	Kaus Aust.	84 40.9 -34 24.4	64	21 54	////	18 12	19 37	20 26	20 47			Subtract				
	16	58 31.6 25.6				62	21 27	////	17 43	19 03	19 56	20 26			Alt.	15	16	17	
	17	73 31.6 25.2	40	Kochab	137 17.5 +74 20.5	60	21 07	////	17 21	18 38	19 33	20 08			°	'	'	'	
	18	88 31.5 +21 24.8	57	Markab	14 21.4 +14 58.0	58	20 50	////	17 03	18 18	19 15	19 53			0	13.3	13.0	12.9	
	19	103 31.4 24.4	8	Menkar	315 00.6 +3 55.1	56	20 36	////	16 48	18 01	18 59	19 41			4	13.3	13.0	12.9	
	20	118 31.4 24.0	36	Menkent	148 58.7 -36 09.4	54	20 24	////	16 35	17 47	18 46	19 30			8	13.3	13.1	12.9	
	21	133 31.3 23.6	24	Miapl'dus	221 49.9 -69 32.2	52	20 13	////	16 23	17 35	18 34	19 20			12	13.4	13.1	13.0	
	22	148 31.3 23.2				50	20 04	23 23	16 13	17 24	18 24	19 11			16	13.4	13.2	13.0	
	23	163 31.2 22.7	9	Mirfak	309 42.8 +49 42.2	45	19 44	22 04	15 52	17 01	18 02	18 52			20	13.5	13.3	13.1	
			50	Nunki	76 51.7 -26 21.2	40	19 28	21 25	15 35	16 43	17 44	18 37			24	13.6	13.4	13.2	
17	0	178 31.1 +21 22.3	52	Peacock	54 26.9 -56 52.6	35	19 14	20 57	15 21	16 28	17 30	18 24			28	13.7	13.5	13.4	
	1	193 31.1 21.9	21	Pollux	244 21.1 +28 08.1	30	19 03	20 37	15 08	16 14	17 17	18 13			32	13.8	13.6	13.5	
	2	208 31.0 21.5	20	Procyon	245 45.4 +5 20.4	20	18 43	20 05	14 47	15 52	16 55	17 53			36	14.0	13.7	13.6	
	3	223 31.0 21.1				10	18 25	19 41	14 29	15 32	16 35	17 36			40	14.1	13.9	13.8	
	4	238 30.9 20.7	46	R'alhague	96 46.4 +12 35.6	0	18 10	19 24	14 11	15 14	16 17	17 20			44	14.2	14.1	14.0	
	5	253 30.8 20.3	26	Regulus	208 29.9 +12 11.1	10	17 54	19 08	13 54	14 55	15 59	17 03			48	14.4	14.3	14.2	
	6	268 30.8 +21 19.9	11	Rigel	281 54.0 -8 15.0	20	17 37	18 55	13 36	14 35	15 40	16 46			52	14.6	14.4	14.4	
	7	283 30.7 19.5	38	Rigil Kent.	140 51.0 -60 39.6	30	17 18	18 42	13 14	14 12	15 17	16 26			56	14.8	14.6	14.6	
	8	298 30.7 19.0	44	Sabik	103 02.0 -15 40.3	35	17 07	18 36	13 02	13 59	15 04	16 14			60	14.9	14.9	14.8	
	9	313 30.6 18.6				40	16 54	18 30	12 48	13 44	14 49	16 00			64	15.1	15.1	15.1	
	10	328 30.6 18.2	3	Schedar	350 30.0 +56 17.5	45	16 40	18 25	12 31	13 25	14 30	15 44			68	15.3	15.3	15.3	
	11	343 30.5 17.8	45	Shaula	97 20.5 -37 04.5	50	16 21	18 17	12 10	13 02	14 08	15 24			72	15.5	15.5	15.5	
	12	358 30.4 +21 17.4	18	Sirius	259 12.3 -16 39.2	52	16 13	18 15	12 01	12 51	13 57	15 15			76	15.7	15.8	15.8	
	13	1 30.4 17.0	33	Spica	159 17.0 -10 55.9	54	16 03	18 12	11 50	12 39	13 45	15 04			80	16.0	16.0	16.0	
	14	28 30.3 16.5	23	Suhail	223 24.8 -43 15.3	56	15 52	18 09	11 37	12 25	13 30	14 52							

G M T	VENUS — 3.4		MARS 2.0		JUPITER — 1.3		SATURN 0.7		MOON					
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code		
h	o	°	o	°	o	°	o	°	o	°	o	°		
18	0	295 01.8	191 43.9	+23 05.6	168 10.8	+20 18.7	165 11.3	+18 58.8	72 17.2	-13 58.9	200 39.5	33	+22 40.3	- 46
	1	310 04.3	206 43.1	05.4	183 11.6	18.4	180 13.2	58.7	87 19.7	58.9	215 01.8	34	22 35.7	- 47
	2	325 06.8	221 42.2	05.2	198 12.4	18.0	195 15.1	58.6	102 22.1	58.9	229 24.2	34	22 31.0	- 50
	3	340 09.2	236 41.3	.. 05.0	213 13.2	.. 17.6	210 17.0	.. 58.4	117 24.6	.. 58.9	243 46.6	34	-22 26.0	- 50
	4	355 11.7	251 40.5	04.8	228 14.1	17.2	225 18.9	58.3	132 27.1	59.0	258 09.0	35	22 21.0	- 53
	5	10 14.1	266 39.6	04.6	243 14.9	16.8	240 20.8	58.2	147 29.6	59.0	272 31.5	36	22 15.7	- 54
	6	25 16.6	281 38.8	+23 04.5	258 15.7	+20 16.5	255 22.7	+18 58.0	162 32.0	-13 59.0	286 54.1	36	+22 10.3	- 55
	7	40 19.1	296 37.9	04.3	273 16.5	16.1	270 24.6	57.9	177 34.5	59.0	301 16.7	36	22 04.8	- 58
	8	55 21.5	311 37.0	04.1	288 17.3	15.7	285 26.5	57.8	192 37.0	59.0	315 39.3	37	21 59.0	- 59
	9	70 24.0	326 36.2	.. 03.9	303 18.1	.. 15.3	300 28.4	.. 57.6	207 39.4	.. 59.0	330 02.0	38	-21 53.1	- 60
	10	85 26.5	341 35.3	03.7	318 18.9	14.9	315 30.3	57.5	222 41.9	59.0	344 24.8	39	21 47.1	- 64
	11	100 28.9	356 34.5	03.5	333 19.7	14.5	330 32.2	57.3	237 44.4	59.0	358 47.7	39	21 40.9	- 64
	12	115 31.4	11 33.6	+23 03.3	348 20.5	+20 14.2	345 34.1	+18 57.2	252 46.9	-13 59.0	13 10.6	40	+21 34.5	- 65
	13	130 33.9	26 32.7	03.1	3 21.3	13.8	0 36.1	57.1	267 49.3	59.0	27 33.6	40	21 28.0	- 66
	14	145 36.3	41 31.9	02.9	18 22.1	13.4	15 38.0	56.9	282 51.8	59.0	41 56.6	42	21 21.4	- 68
	15	160 38.8	56 31.0	.. 02.7	33 23.0	.. 13.0	30 39.9	.. 56.8	297 54.3	.. 59.1	56 19.8	42	-21 14.6	- 70
	16	175 41.2	71 30.2	02.5	48 23.8	12.6	45 41.8	56.7	312 56.7	59.1	70 43.0	42	21 07.6	- 71
	17	190 43.7	86 29.3	02.3	63 24.6	12.2	60 43.7	56.5	327 59.2	59.1	85 06.2	44	21 00.5	- 73
	18	205 46.2	101 28.4	+23 02.1	78 25.4	+20 11.9	75 45.6	+18 56.4	343 01.7	-13 59.1	99 29.6	44	+20 53.2	- 74
	19	220 48.6	116 27.6	01.9	93 26.2	11.5	90 47.5	56.2	358 04.1	59.1	113 53.0	45	20 45.8	- 75
	20	235 51.1	131 26.7	01.7	108 27.0	11.1	105 49.4	56.1	13 06.6	59.1	128 16.5	45	20 38.3	- 77
	21	250 53.6	146 25.9	.. 01.5	123 27.8	.. 10.7	120 51.3	.. 56.0	28 09.1	.. 59.1	142 40.0	47	-20 30.6	- 78
	22	265 56.0	161 25.0	01.3	138 28.6	10.3	135 53.2	55.8	43 11.6	59.1	157 03.7	47	20 22.8	- 80
	23	280 58.5	176 24.1	01.1	153 29.4	09.9	150 55.1	55.7	58 14.0	59.1	171 27.4	48	20 14.8	- 81
19	0	296 01.0	191 23.3	+23 00.9	168 30.3	+20 09.6	165 57.0	+18 55.6	73 16.5	-13 59.1	185 51.2	49	+20 06.7	- 82
	1	311 03.4	206 22.4	00.7	183 31.1	09.2	180 58.9	55.4	88 19.0	59.2	200 15.1	50	19 58.5	- 84
	2	326 05.9	221 21.6	00.5	198 31.9	08.8	196 00.8	55.3	103 21.4	59.2	214 39.1	51	19 50.1	- 85
	3	341 08.4	236 20.7	.. 00.3	213 32.7	.. 08.4	211 02.7	.. 55.2	118 23.9	.. 59.2	229 03.2	51	-19 41.6	- 87
	4	356 10.8	251 19.9	23 00.1	228 33.5	08.0	226 04.6	55.0	133 26.4	59.2	243 27.3	53	19 32.9	- 87
	5	11 13.3	266 19.0	22 59.8	243 34.3	07.6	241 06.5	54.9	148 28.8	59.2	257 51.6	53	19 24.2	- 89
	6	26 15.7	281 18.1	+22 59.6	258 35.1	+20 07.2	256 08.5	+18 54.7	163 31.3	-13 59.2	272 15.9	54	+19 15.3	- 91
	7	41 18.2	296 17.3	59.4	273 35.9	06.9	271 10.4	54.6	178 33.8	59.2	286 40.3	55	19 06.2	- 91
	8	56 20.7	311 16.4	59.2	288 36.7	06.5	286 12.3	54.5	193 36.2	59.2	301 04.8	56	18 57.1	- 93
	9	71 23.1	326 15.6	.. 59.0	303 37.6	.. 06.1	301 14.2	.. 54.3	208 38.7	.. 59.2	315 29.4	57	-18 47.8	- 94
	10	86 25.6	341 14.7	58.8	318 38.4	05.7	316 16.1	54.2	223 41.2	59.2	329 54.1	58	18 38.4	- 95
	11	101 28.1	356 13.9	58.5	333 39.2	05.3	331 18.0	54.1	238 43.6	59.3	344 18.9	59	18 28.9	- 96
	12	116 30.5	11 13.0	+22 58.3	348 40.0	+20 04.9	346 19.9	+18 53.9	253 46.1	-13 59.3	358 43.8	59	+18 19.3	- 98
	13	131 33.0	26 12.1	58.1	3 40.8	04.5	1 21.8	53.8	268 48.6	59.3	13 08.7	61	18 09.5	- 99
	14	146 35.5	41 11.3	57.9	18 41.6	04.1	16 23.7	53.6	283 51.0	59.3	27 33.8	62	17 59.6	- 99
	15	161 37.9	56 10.4	.. 57.6	33 42.4	.. 03.7	31 25.6	.. 53.5	298 53.5	.. 59.3	41 59.0	62	-17 49.7	-101
	16	176 40.4	71 09.6	57.4	48 43.3	03.4	46 27.5	53.4	313 56.0	59.3	56 24.2	63	17 39.6	-102
	17	191 42.9	86 08.7	57.2	63 44.1	03.0	61 29.4	53.2	328 58.4	59.3	70 49.5	65	17 29.4	-103
	18	206 45.3	101 07.9	+22 57.0	78 44.9	+20 02.6	76 31.3	+18 53.1	344 00.9	-13 59.3	85 15.0	65	+17 19.1	-104
	19	221 47.8	116 07.0	56.7	93 45.7	02.2	91 33.2	52.9	359 03.4	59.3	99 40.5	67	17 08.7	-105
	20	236 50.2	131 06.2	56.5	108 46.5	01.8	106 35.1	52.8	14 05.8	59.4	114 06.2	67	16 58.2	-107
	21	251 52.7	146 05.3	.. 56.3	123 47.3	.. 01.4	121 37.0	.. 52.7	29 08.3	.. 59.4	128 31.9	68	-16 47.5	-107
	22	266 55.2	161 04.4	56.0	138 48.1	01.0	136 38.9	52.5	44 10.8	59.4	142 57.7	69	16 36.8	-108
	23	281 57.6	176 03.6	55.8	153 49.0	00.6	151 40.8	52.4	59 13.2	59.4	157 23.6	70	16 26.0	-109
20	0	297 00.1	191 02.7	+22 55.6	168 49.8	+20 00.2	166 42.8	+18 52.3	74 15.7	-13 59.4	171 49.6	71	+16 15.1	-110
	1	312 02.6	206 01.9	55.3	183 50.6	19 59.8	181 44.7	52.1	89 18.2	59.4	186 15.7	73	16 04.1	-111
	2	327 05.0	221 01.0	55.1	198 51.4	59.5	196 46.6	52.0	104 20.6	59.4	200 42.0	73	15 53.0	-112
	3	342 07.5	236 00.2	.. 54.8	213 52.2	.. 59.1	211 48.5	.. 51.8	119 23.1	.. 59.4	215 08.3	74	-15 41.8	-113
	4	357 10.0	250 59.3	54.6	228 53.0	58.7	226 50.4	51.7	134 25.6	59.4	229 34.7	75	15 30.5	-113
	5	12 12.4	265 58.5	54.4	243 53.8	58.3	241 52.3	51.6	149 28.0	59.5	244 01.2	76	15 19.2	-115
	6	27 14.9	280 57.6	+22 54.1	258 54.7	+19 57.9	256 54.2	+18 51.4	164 30.5	-13 59.5	258 27.8	76	+15 07.7	-115
	7	42 17.4	295 56.8	53.9	273 55.5	57.5	271 56.1	51.3	179 32.9	59.5	272 54.4	78	14 56.2	-116
	8	57 19.8	310 55.9	53.6	288 56.3	57.1	286 58.0	51.2	194 35.4	59.5	287 21.2	79	14 44.6	-117
	9	72 22.3	325 55.0	.. 53.4	303 57.1	.. 56.7	301 59.9	.. 51.0	209 37.9	.. 59.5	301 48.1	80	-14 32.9	-118
	10	87 24.7	340 54.2	53.1	318 57.9	56.3	317 01.8	50.9	224 40.3	59.5	316 15.1	81	14 21.1	-119
	11	102 27.2	355 53.3	52.9	333 58.7	55.9	332 03.7	50.7	239 42.8	59.5	330 42.2	81	14 09.2	-119
	12	117 29.7	10 52.5	+22 52.6	348 59.6	+19 55.5	347 05.6	+18 50.6	254 45.3	-13 59.5	345 09.3	83	+13 57.3	-120
	13	132 32.1	25 51.6	52.4	4 00.4	55.1	2 07.5	50.5	269 47.7	59.6	359 36.6	84	13 45.3	-121
	14	147 34.6	40 50.8	52.1	19 01.2	54.7	17 09.4	50.3	284 50.2	59.6	14 04.0	84	13 33.2	-121
	15	162 37.1	55 49.9	.. 51.9	34 02.0	.. 54.3	32 11.3	.. 50.2	299 52.6	.. 59.6	28 31.4	86	-13 21.1	-122
	16	177 39.5	70 49.1	51.6	49 02.8	54.0	47 13.2	50.0	314 55.1	59.6	42 59.0	86	13 08.9	-123
	17	192 42.0	85 48.2	51.4	64 03.6	53.6	62 15.1	49.9	329 57.6	59.6	57 26.6	87	12 56.6	-123
	18	207 44.5	100 47.4	+22 51.1	79 04.5	+19 53.2	77 17.1	+18 49.8	345 00.0	-13 59.6	71 54.3	88	+12 44.3	-124
	19													

G M T	SUN			STARS			Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.	No.	Name	SHA	Dec.								Sun's Low'r Limb Add	Venus Add	Mars Add			
										18	19	20	21						
h	°	'	°		'	°	N	h	m	h	m	h	m	h	m	Alt.			
18	0	178 29.8	+21 12.3	7	Acamar	315 51.3	-40 28.6	72	□	□	□	□	2 42	5 22					
	1	193 29.7	11.9	5	Achernar	335 58.9	-57 27.3	70	□	□	□	□	3 23	5 40					
	2	208 29.7	11.5	30	Acrux	173 58.2	-62 51.6	68	0 35	□	□	1 30	3 50	5 54					
	3	223 29.6	11.1	19	Adhara	255 47.0	-28 54.6	66	1 49	///	0 03	2 08	4 10	6 05					
	4	238 29.6	10.6	10	Aldebaran	291 39.4	+16 25.3	64	2 25	///	0 48	2 36	4 27	6 14					
	5	253 29.5	10.2					62	2 50	///	1 17	2 56	4 40	6 21					
	6	268 29.4	+21 09.8	32	Alioth	166 58.7	+56 12.2	60	3 10	///	1 40	3 13	4 52	6 28					
	7	283 29.4	09.4	34	Alkaid	153 32.9	+49 32.3	58	3 26	///	1 58	3 27	5 01	6 34					
	8	298 29.3	08.9	55	Al Na'ir	28 37.7	-47 10.3	56	3 40	///	2 13	3 39	5 10	6 39					
	9	313 29.3	08.5	15	Alnilam	276 30.7	-1 13.7	54	3 51	///	2 26	3 50	5 18	6 44					
	10	328 29.2	08.1	25	Alphard	218 39.0	-8 28.0	52	4 02	///	2 38	3 59	5 24	6 48					
	11	343 29.2	07.6					50	4 11	0 59	2 48	4 08	5 31	6 52					
	12	358 29.1	+21 07.2	41	Alphecca	126 47.5	+26 51.9	45	4 30	2 11	3 09	4 25	5 44	7 00					
	13	13 29.1	06.8	1	Alpheratz	358 28.3	+28 50.7	40	4 46	2 49	3 26	4 40	5 54	7 07					
	14	28 29.0	06.3	51	Altair	62 50.2	+8 45.1	35	4 59	3 17	3 41	4 52	6 03	7 13					
	15	43 29.0	05.9	2	Ankaa	353 58.2	-42 32.5	30	5 11	3 37	3 53	5 03	6 12	7 18					
	16	58 28.9	05.5	42	Antares	113 19.3	-26 20.2	20	5 30	4 08	4 14	5 21	6 25	7 27					
	17	73 28.9	05.0					10	5 47	4 31	4 33	5 37	6 37	7 35					
	18	88 28.8	+21 04.6	37	Arcturus	146 35.2	+19 24.9	0	6 03	4 48	4 50	5 51	6 49	7 42					
	19	103 28.8	04.2	43	Atria	108 59.7	-68 57.2	10	6 18	5 04	5 07	6 06	7 00	7 49					
	20	118 28.7	03.7	22	Avior	234 36.5	-59 22.1	20	6 34	5 18	5 26	6 22	7 12	7 57					
	21	133 28.7	03.3	13	Bellatrix	279 18.8	+6 18.7	30	6 53	5 30	5 47	6 40	7 25	8 06					
	22	148 28.6	02.9	16	Betelge'se	271 48.6	+7 24.1	35	7 04	5 35	6 00	6 50	7 33	8 11					
	23	163 28.6	02.4					40	7 16	5 41	6 14	7 02	7 42	8 16					
				17	Canopus	264 15.9	-52 40.1	45	7 31	5 48	6 31	7 16	7 52	8 23					
				12	Capella	281 39.0	+45 57.2	50	7 49	5 54	6 52	7 33	8 05	8 31					
				53	Deneb	50 00.6	+45 07.3	52	7 57	5 56	7 01	7 41	8 11	8 34					
				28	Denebola	183 18.0	+14 49.3	54	8 06	5 59	7 13	7 50	8 17	8 38					
				4	Diphda	349 39.3	-18 13.5	56	8 17	6 01	7 25	8 00	8 24	8 43					
				27	Dubhe	194 45.1	+61 59.6	58	8 29	6 05	7 40	8 11	8 32	8 47					
				14	Elnath	279 07.8	+28 34.3	60	8 43	6 08	7 57	8 24	8 41	8 53					
				47	Eltanin	91 05.8	+51 29.8	S											
				54	Enif	34 29.4	+9 40.4												
				56	Fomalhaut	16 11.5	-29 51.2												
				31	Gacrux	172 49.6	-56 52.2												
				29	Gienah	176 37.1	-17 17.9												
				35	Hadar	149 49.5	-60 09.9												
				6	Hamal	328 49.8	+23 15.2												
				48	Kaus Aust.	84 40.9	-34 24.4												
				40	Kochab	137 17.5	+74 20.5												
				57	Markab	14 21.3	+14 58.1												
				8	Menkar	315 00.5	+3 55.1												
				36	Menkent	148 58.8	-36 09.4												
				24	Miapl'dus	221 50.0	-69 32.2												
				9	Mirfak	309 42.8	+49 42.2												
				50	Nunki	76 51.7	-26 21.2												
				52	Peacock	54 26.8	-56 52.6												
				21	Pollux	244 21.1	+28 08.1												
				20	Procyon	245 45.4	+5 20.4												
				46	R'alhague	96 46.4	+12 35.6												
				26	Regulus	208 29.9	+12 11.1												
				11	Rigel	281 54.0	-8 15.0												
				38	Rigel Kent.	140 51.0	-60 39.6												
				44	Sabik	103 02.0	-15 40.3												
				3	Schedar	350 30.0	+56 17.5												
				45	Shaula	97 20.5	-37 04.5												
				18	Sirius	259 12.3	-16 39.2												
				33	Spica	159 17.0	-10 55.9												
				23	Suhail	223 24.8	-43 15.3												
				49	Vega	81 07.9	+38 44.6												
				39	Zub'g'bi	137 53.4	-15 51.6												
								S											

G M T	T GHA	VENUS -3.4		MARS 2.0		JUPITER -1.3		SATURN 0.7		MOON			
		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
21 0	297 59.2	190 42.3	+22 49.5	169 09.4	+19 50.8	167 28.5	+18 48.9	75 14.8	-13 59.7	158 42.6	94	+11 29.0	-127
1	313 01.7	205 41.4	49.3	184 10.2	50.4	182 30.4	48.8	90 17.3	59.7	173 11.0	94	11 16.3	-128
2	328 04.2	220 40.6	49.0	199 11.0	50.0	197 32.3	48.7	105 19.7	59.7	187 39.4	96	11 03.5	-128
3	343 06.6	235 39.7	48.7	214 11.8	49.6	212 34.2	48.5	120 22.2	59.7	202 08.0	96	-10 50.7	-129
4	358 09.1	250 38.9	48.5	229 12.6	49.2	227 36.1	48.4	135 24.6	59.7	216 36.6	97	10 37.8	-129
5	13 11.6	265 38.0	48.2	244 13.5	48.8	242 38.0	48.2	150 27.1	59.7	231 05.3	98	10 24.9	-130
6	28 14.0	280 37.2	+22 47.9	259 14.3	+19 48.4	257 39.9	+18 48.1	165 29.6	-13 59.8	245 34.1	99	+10 11.9	-130
7	43 16.5	295 36.3	47.7	274 15.1	48.0	272 41.8	48.0	180 32.0	59.8	260 03.0	100	9 58.9	-131
8	58 19.0	310 35.5	47.4	289 15.9	47.6	287 43.7	47.8	195 34.5	59.8	274 32.0	100	9 45.8	-131
9	73 21.4	325 34.6	47.1	304 16.7	47.2	302 45.6	47.7	210 36.9	59.8	289 01.0	102	9 32.7	-131
10	88 23.9	340 33.8	46.8	319 17.6	46.8	317 47.5	47.6	225 39.4	59.8	303 30.2	102	9 19.6	-132
11	103 26.3	355 32.9	46.6	334 18.4	46.4	332 49.4	47.4	240 41.9	59.8	317 59.4	103	9 06.4	-132
12	118 28.8	10 32.1	+22 46.3	349 19.2	+19 46.0	347 51.3	+18 47.3	255 44.3	-13 59.8	332 28.7	103	+ 8 53.2	-132
13	133 31.3	25 31.2	46.0	4 20.0	45.6	2 53.2	47.1	270 46.8	59.9	346 58.0	105	8 40.0	-133
14	148 33.7	40 30.4	45.7	19 20.8	45.2	17 55.2	47.0	285 49.2	59.9	1 27.5	105	8 26.7	-133
15	163 36.2	55 29.5	45.4	34 21.7	44.8	32 57.1	46.9	300 51.7	59.9	15 57.0	106	8 13.4	-133
16	178 38.7	70 28.7	45.2	49 22.5	44.4	47 59.0	46.7	315 54.2	59.9	30 26.6	107	8 00.1	-133
17	193 41.1	85 27.8	44.9	64 23.3	44.0	63 00.9	46.6	330 56.6	59.9	44 56.3	108	7 46.8	-134
18	208 43.6	100 27.0	+22 44.6	79 24.1	+19 43.6	78 02.8	+18 46.4	345 59.1	-13 59.9	59 26.1	108	+ 7 33.4	-134
19	223 46.1	115 26.1	44.3	94 25.0	43.2	93 04.7	46.3	1 01.5	59.9	73 55.9	109	7 20.0	-134
20	238 48.5	130 25.3	44.0	109 25.8	42.8	108 06.6	46.2	16 04.0	13 59.9	88 25.8	110	7 06.6	-134
21	253 51.0	145 24.4	43.7	124 26.6	42.4	123 08.5	46.0	31 06.4	14 00.0	102 55.8	111	6 53.2	-135
22	268 53.5	160 23.6	43.4	139 27.4	42.0	138 10.4	45.9	46 08.9	00.0	117 25.9	111	6 39.7	-135
23	283 55.9	175 22.8	43.2	154 28.2	41.6	153 12.3	45.7	61 11.4	00.0	131 56.0	112	6 26.2	-135
22 0	298 58.4	190 21.9	+22 42.9	169 29.1	+19 41.2	168 14.2	+18 45.6	76 13.8	-14 00.0	146 26.2	113	+ 6 12.7	-135
1	314 00.8	205 21.1	42.6	184 29.9	40.8	183 16.1	45.5	91 16.3	00.0	160 56.5	113	5 59.2	-135
2	329 03.3	220 20.2	42.3	199 30.7	40.4	198 18.0	45.3	106 18.7	00.0	175 26.8	114	5 45.7	-135
3	344 05.8	235 19.4	42.0	214 31.5	40.0	213 19.9	45.2	121 21.2	00.0	189 57.2	115	5 32.2	-136
4	359 08.2	250 18.5	41.7	229 32.4	39.6	228 21.8	45.0	136 23.6	00.1	204 27.7	115	5 18.6	-135
5	14 10.7	265 17.7	41.4	244 33.2	39.2	243 23.7	44.9	151 26.1	00.1	218 58.2	116	5 05.1	-136
6	29 13.2	280 16.8	+22 41.1	259 34.0	+19 38.8	258 25.6	+18 44.8	166 28.5	-14 00.1	233 28.8	116	+ 4 51.5	-135
7	44 15.6	295 16.0	40.8	274 34.8	38.4	273 27.5	44.6	181 31.0	00.1	247 59.4	118	4 38.0	-136
8	59 18.1	310 15.1	40.5	289 35.6	38.0	288 29.4	44.5	196 33.5	00.1	262 30.2	118	4 24.4	-136
9	74 20.6	325 14.3	40.2	304 36.5	37.6	303 31.3	44.3	211 35.9	00.1	277 01.0	118	4 10.8	-136
10	89 23.0	340 13.5	39.9	319 37.3	37.2	318 33.2	44.2	226 38.4	00.1	291 31.8	119	3 57.2	-135
11	104 25.5	355 12.6	39.6	334 38.1	36.8	333 35.2	44.1	241 40.8	00.2	306 02.7	120	3 43.7	-136
12	119 28.0	10 11.8	+22 39.3	349 38.9	+19 36.3	348 37.1	+18 43.9	256 43.3	-14 00.2	320 33.7	120	+ 3 30.1	-136
13	134 30.4	25 10.9	39.0	4 39.8	35.9	3 39.0	43.8	271 45.7	00.2	335 04.7	121	3 16.5	-136
14	149 32.9	40 10.1	38.7	19 40.6	35.5	18 40.9	43.6	286 48.2	00.2	349 35.8	121	3 02.9	-135
15	164 35.3	55 09.2	38.3	34 41.4	35.1	33 42.8	43.5	301 50.6	00.2	4 06.9	122	2 49.4	-136
16	179 37.8	70 08.4	38.0	49 42.2	34.7	48 44.7	43.4	316 53.1	00.2	18 38.1	122	2 35.8	-136
17	194 40.3	85 07.6	37.7	64 43.1	34.3	63 46.6	43.2	331 55.6	00.2	33 09.3	123	2 22.2	-135
18	209 42.7	100 06.7	+22 37.4	79 43.9	+19 33.9	78 48.5	+18 43.1	346 58.0	-14 00.3	47 40.6	124	+ 2 08.7	-136
19	224 45.2	115 05.9	37.1	94 44.7	33.5	93 50.4	42.9	2 00.5	00.3	62 12.0	124	1 55.1	-135
20	239 47.7	130 05.0	36.8	109 45.5	33.1	108 52.3	42.8	17 02.9	00.3	76 43.4	124	1 41.6	-135
21	254 50.1	145 04.2	36.5	124 46.4	32.7	123 54.2	42.7	32 05.4	00.3	91 14.8	125	1 28.1	-136
22	269 52.6	160 03.3	36.1	139 47.2	32.3	138 56.1	42.5	47 07.8	00.3	105 46.3	125	1 14.5	-135
23	284 55.1	175 02.5	35.8	154 48.0	31.9	153 58.0	42.4	62 10.3	00.3	120 17.8	126	1 01.0	-135
23 0	299 57.5	190 01.7	+22 35.5	169 48.8	+19 31.5	168 59.9	+18 42.2	77 12.7	-14 00.3	134 49.4	127	+ 0 47.5	-134
1	315 00.0	205 00.8	35.2	184 49.7	31.1	184 01.8	42.1	92 15.2	00.4	149 21.1	126	0 34.1	-135
2	330 02.5	220 00.0	34.9	199 50.5	30.6	199 03.7	42.0	107 17.6	00.4	163 52.7	128	0 20.6	-134
3	345 04.9	234 59.1	34.5	214 51.3	30.2	214 05.6	41.8	122 20.1	00.4	178 24.5	127	+ 0 07.2	-135
4	0 07.4	249 58.3	34.2	229 52.1	29.8	229 07.5	41.7	137 22.5	00.4	192 56.2	128	- 0 06.3	-134
5	15 09.8	264 57.5	33.9	244 53.0	29.4	244 09.4	41.5	152 25.0	00.4	207 28.0	129	0 19.7	-134
6	30 12.3	279 56.6	+22 33.6	259 53.8	+19 29.0	259 11.3	+18 41.4	167 27.4	-14 00.4	221 59.9	128	- 0 33.1	-133
7	45 14.8	294 55.8	33.2	274 54.6	28.6	274 13.2	41.3	182 29.9	00.5	236 31.7	130	0 46.4	-134
8	60 17.2	309 54.9	32.9	289 55.5	28.2	289 15.2	41.1	197 32.3	00.5	251 03.7	129	0 59.8	-133
9	75 19.7	324 54.1	32.6	304 56.3	27.8	304 17.1	41.0	212 34.8	00.5	265 35.6	130	1 13.1	-133
10	90 22.2	339 53.3	32.2	319 57.1	27.4	319 19.0	40.8	227 37.2	00.5	280 07.6	131	1 26.4	-133
11	105 24.6	354 52.4	31.9	334 57.9	27.0	334 20.9	40.7	242 39.7	00.5	294 39.7	130	1 39.7	-132
12	120 27.1	9 51.6	+22 31.6	349 58.8	+19 26.6	349 22.8	+18 40.6	257 42.1	-14 00.5	309 11.7	131	- 1 52.9	-132
13	135 29.6	24 50.8	31.2	4 59.6	26.1	4 24.7	40.4	272 44.6	00.5	323 43.8	132	2 06.1	-132
14	150 32.0	39 49.9	30.9	20 00.4	25.7	19 26.6	40.3	287 47.0	00.6	338 16.0	131	2 19.3	-132
15	165 34.5	54 49.1	30.6	35 01.2	25.3	34 28.5	40.1	302 49.5	00.6	352 48.1	132	2 32.5	-131
16	180 36.9	69 48.2	30.2	50 02.1	24.9	49 30.4	40.0	317 51.9	00.6	7 20.3	132	2 45.6	-131
17	195 39.4	84 47.4	29.9	65 02.9	24.5	64 32.3	39.9	332 54.4	00.6	21 52.5	133	2 58.7	-131
18	210 41.9	99 46.6	+22 29.6	80 03.7	+19 24.1	79 34.2	+18 39.7	347 56.8	-14 00.6	36 24.8	133	- 3 11.8	-130
19	225 44.3	114 45.7	29.2	95 04.6	23.7	94 36.1	39.6	2 59.3	00.6	50 57.1	133	3 24.8	-130
20	240 46.8	129 44.9	28.9	110 05.4	23.3	109 38.0	39.4	18 01.7	00.7	65 29.4	133	3 37.8	-130
21	255 49.3	144 44.1	28.5	125 06.2	22.8	124 39.9	39.3	33 04.2	00.7	80 01.7	134	3 50.8	-129
22	270 51.7	159 43.2	28.2	140 07.0	22.4	139 41.8	39.1	48 06.6	00.7	94 34.1	134	4 03.7	-129
23	285 54.2	174 42.4	27.8	155 07.9	22.0	154 43.7	39.0	63 09.1	00.7	109 06.5	134	4 16.6	-129
24	300 56.7	189 41.5	+22 27.5	170 08.7	+19 21.6	169 45.6	+18 38.9	78 11.5	-14 00.7	123 38.9	134	- 4 29.5	-128
code	-	- 9	- 3	+ 9	- 4	+ 19	- 1	+ 24	0				

G M T	SUN			STARS			Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS																	
	GHA	Dec.	No.	Name	SHA	Dec.				21	22	23	24	Alt.	Sun's Lower Limb	Venus	Mars														
h	°	'	°	°	'	°	N	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m		
21	0	178 26.4	+20 40.2	7	Acamar	315 51.3	-40 28.6	72	□	□	5 22	7 35	9 37	11 36	Alt.	Sun's Lower Limb	Venus	Mars													
1	193 26.4	39.7		5	Achernar	335 58.9	-57 27.3	70	□	□	5 40	7 41	9 35	11 25																	
2	208 26.4	39.3		30	Acrux	173 58.2	-62 51.6	68	1 07	///	5 54	7 47	9 33	11 17																	
3	223 26.3	38.8		19	Adhara	255 47.0	-28 54.6	66	2 02	///	6 05	7 51	9 32	11 10																	
4	238 26.3	38.3		10	Aldebaran	291 39.4	+16 25.3	64	2 34	///	6 14	7 55	9 31	11 04																	
5	253 26.3	37.8						62	2 57	///	6 21	7 58	9 30	10 59																	
6	268 26.2	+20 37.4		32	Alioth	166 58.8	+56 12.2	60	3 16	///	6 28	8 00	9 29	10 54																	
7	283 26.2	36.9		34	Alkaid	153 33.0	+49 32.3	58	3 31	///	6 34	8 03	9 28	10 50																	
8	298 26.2	36.4		55	Al Na'ir	28 37.7	+47 10.3	56	3 44	///	6 39	8 05	9 27	10 47																	
9	313 26.1	36.0		15	Alnilam	276 30.7	-1 13.7	54	3 56	///	6 44	8 07	9 27	10 43																	
10	328 26.1	35.5		25	Alphard	218 39.0	-8 28.0	52	4 06	///	6 48	8 09	9 26	10 41																	
11	343 26.0	35.0						50	4 15	1 12	6 52	8 10	9 26	10 38																	
12	358 26.0	+20 34.5		41	Alphecca	126 47.5	+26 51.9	45	4 33	2 17	7 00	8 14	9 24	10 32																	
13	13 26.0	34.1		1	Alpheratz	358 28.3	+28 50.7	40	4 49	2 54	7 07	8 17	9 23	10 28																	
14	28 25.9	33.6		51	Altair	62 50.2	+8 45.1	35	5 01	3 20	7 13	8 19	9 23	10 24																	
15	43 25.9	33.1		2	Ankaa	353 58.2	-42 32.5	30	5 12	3 39	7 18	8 21	9 22	10 20																	
16	58 25.9	32.6		42	Antares	113 19.3	-26 20.2	20	5 31	4 10	7 27	8 25	9 21	10 14																	
17	73 25.8	32.1						10	5 48	4 31	7 35	8 28	9 20	10 09																	
18	88 25.8	+20 31.7		37	Arcturus	146 35.2	+19 24.9	0	6 03	4 50	7 42	8 32	9 19	10 04																	
19	103 25.8	31.2		43	Atria	108 59.7	-68 57.2	10	6 18	5 04	7 49	8 35	9 18	10 00																	
20	118 25.7	30.7		22	Avior	234 36.5	-59 22.0	20	6 34	5 17	7 57	8 38	9 17	9 54																	
21	133 25.7	30.2		13	Bellatrix	279 18.8	+6 18.7	30	6 52	5 28	8 06	8 42	9 16	9 49																	
22	148 25.7	29.7		16	Betelg'se	271 48.5	+7 24.1	35	7 02	5 34	8 11	8 44	9 15	9 45																	
23	163 25.6	29.3						40	7 14	5 40	8 16	8 46	9 14	9 42																	
				17	Canopus	264 15.9	-52 40.1	45	7 28	5 45	8 23	8 49	9 14	9 37																	
				12	Capella	281 38.9	+45 57.2	50	7 45	5 52	8 31	8 53	9 13	9 32																	
				53	Deneb	50 00.6	+45 07.3	52	7 53	5 54	8 34	8 54	9 12	9 30																	
				28	Denebola	183 18.0	+14 49.3	54	8 03	5 56	8 38	8 56	9 12	9 28																	
				4	Diphda	349 39.3	-18 13.5	56	8 13	5 59	8 43	8 58	9 12	9 25																	
								58	8 24	6 01	8 47	9 00	9 11	9 22																	
				27	Dubhe	194 45.2	+61 59.6	60	8 38	6 05	8 53	9 02	9 10	9 18																	
				14	Elnath	279 07.8	+28 34.3	S																							
				47	Eltanin	91 05.8	+51 29.8																								
				54	Enif	34 29.4	+9 40.4																								
				56	Fomalhaut	16 11.5	-29 51.2																								
22	0	178 25.6	+20 28.8	31	Gacrux	172 49.6	-56 52.2	72	N	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m
1	193 25.6	28.3		29	Gienah	176 37.1	-17 17.9	70	□	□	21 24	21 10	20 56	20 41																	
2	208 25.6	27.8		35	Hadar	149 49.5	-60 09.9	68	22 58	///	21 16	21 08	21 00	20 52																	
3	223 25.5	27.3		6	Hamal	328 49.8	+23 15.2	66	22 07	///	21 10	21 07	21 04	21 01																	
4	238 25.5	26.8		48	Kaus Aust.	84 40.9	-34 24.4	64	21 36	///	21 04	21 06	21 07	21 08																	
5	253 25.5	26.4						62	21 13	///	21 00	21 05	21 10	21 15																	
6	268 25.4	+20 25.9		40	Kochab	137 17.6	+74 20.5	60	20 55	///	20 55	21 04	21 12	21 21																	
7	283 25.4	25.4		57	Markab	14 21.3	+14 58.1	58	20 40	///	20 52	21 03	21 14	21 25																	
8	298 25.4	24.9		8	Menkar	315 00.5	+3 35.1	56	20 27	///	20 48	21 03	21 16	21 30																	
9	313 25.3	24.4		36	Menkent	148 58.8	-36 09.4	54	20 16	///	20 45	21 02	21 18	21 34																	
10	328 25.3	23.9		24	Miapl'dus	221 50.0	-69 32.2	52	20 06	///	20 43	21 02	21 20	21 38																	
11	343 25.3	23.4						50	19 57	22 56	20 40	21 01	21 21	21 41																	
12	358 25.3	+20 22.9		9	Mirfak	309 42.7	+49 42.2	45	19 39	21 53	20 35	21 00	21 24	21 48																	
13	13 25.2	22.5		50	Nunki	76 51.7	-26 21.2	40	19 24	21 18	20 30	20 59	21 27	21 54																	
14	28 25.2	22.0		52	Peacock	54 26.8	-56 52.6	35	19 11	20 52	20 26	20 58	21 29	22 00																	
15	43 25.2	21.5		21	Pollux	244 21.1	+28 08.1	30	19 00	20 32	20 23	20 58	21 31	22 04																	
16	58 25.1	21.0		20	Procyon	245 45.4	+5 20.4	20	18 41	20 02	20 17	20 57	21 35	22 12																	
17	73 25.1	20.5						10	18 25	19 41	20 11	20 55	21 38	22 19																	
18	88 25.1	+20 20.0		46	R'halguae	96 46.4	+12 35.6	0	18 10	19 23	20 06	20 54	21 41	22 26																	
19	103 25.1	19.5		26	Regulus	208 29.9	+12 11.1	10	17 55	19 09	20 01	20 53	21 44	22 33																	
20	118 25.0	19.0		11	Rigel	281 54.0	-8 15.0	20	17 39	18 56	19 55	20 52	21 47	22 40																	
21	133 25.0	18.5		38	Rigel Kent.	140 51.0	-60 39.6	30	17 21	18 45	19 49	20 51	21 50	22 48																	
22	148 25.0	18.0		44	Sabik	103 02.0	-15 40.3	35	17 11	18 40	19 45	20 50	21 52	22 53																	
23	163 25.0	17.5						40	16 59	18 34	19 41	20 49	21 55	22 58																	
				3	Schedar	350 29.9	+56 17.5	45	16 45	18 29	19 36	20 48	21 57	23 04																	
				45	Shaula	97 20.5	-37 04.5	50	16 28	18 23	19 30	20 46	22 00	23 12																	
				18	Sirius	259 12.3	-16 39.2	52	16 20	18 21	19 27	20 46	22 02																		

G M T	T GHA	VENUS — 3.4			MARS 2.0			JUPITER — 1.3			SATURN 0.7			MOON				
		GHA	Dec.		GHA	Dec.		GHA	Dec.		GHA	Dec.		GHA	code	Dec.	code	
h	o	'	o	'	o	'	o	'	o	'	o	'	o	'	o	'	o	'
24	0	300 56.7	189 41.5	+22 27.5	170 08.7	+19 21.6	169 45.6	+18 38.9	78 11.5	-14 00.7	123 38.9	134 -	4 29.5	-128				
	1	315 59.1	204 40.7	27.1	185 09.5	21.2	184 47.5	38.7	93 14.0	00.7	138 11.3	134	4 42.3	-128				
	2	331 01.6	219 39.9	26.8	200 10.4	20.8	199 49.4	38.6	108 16.4	00.8	152 43.7	135	4 55.1	-128				
	3	346 04.1	234 39.0	.. 26.4	215 11.2	.. 20.4	214 51.3	.. 38.4	123 18.9	.. 00.8	167 16.2	135	5 07.9	-127				
	4	1 06.5	249 38.2	26.1	230 12.0	19.9	229 53.2	38.3	138 21.3	00.8	181 48.7	135	5 20.6	-126				
	5	16 09.0	264 37.4	25.7	245 12.9	19.5	244 55.1	38.2	153 23.8	00.8	196 21.2	135	5 33.2	-127				
	6	31 11.4	279 36.5	+22 25.4	260 13.7	+19 19.1	259 57.0	+18 38.0	168 26.2	-14 00.8	210 53.7	135	- 5 45.9	-125				
	7	46 13.9	294 35.7	25.0	275 14.5	18.7	274 59.0	37.9	183 28.7	00.8	225 26.2	136	5 58.4	-126				
	8	61 16.4	309 34.9	24.7	290 15.3	18.3	290 00.9	37.7	198 31.1	00.9	239 58.8	136	6 11.0	-125				
	9	76 18.8	324 34.0	.. 24.3	305 16.2	.. 17.9	305 02.8	.. 37.6	213 33.6	.. 00.9	254 31.4	136	6 23.5	-124				
	10	91 21.3	339 33.2	24.0	320 17.0	17.5	320 04.7	37.5	228 36.0	00.9	269 04.0	136	6 35.9	-124				
	11	106 23.8	354 32.4	23.6	335 17.8	17.0	335 06.6	37.3	243 38.5	00.9	283 36.6	136	6 48.3	-124				
	12	121 26.2	9 31.5	+22 23.2	350 18.7	+19 16.6	350 08.5	+18 37.2	258 40.9	-14 00.9	298 09.2	136	- 7 00.7	-123				
	13	136 28.7	24 30.7	22.9	5 19.5	16.2	5 10.4	37.0	273 43.4	00.9	312 41.8	136	7 13.0	-123				
	14	151 31.2	39 29.9	22.5	20 20.3	15.8	20 12.3	36.9	288 45.8	01.0	327 14.4	136	7 25.3	-122				
	15	166 33.6	54 29.0	.. 22.1	35 21.2	.. 15.4	35 14.2	.. 36.7	303 48.2	.. 01.0	341 47.0	137	7 37.5	-121				
	16	181 36.1	69 28.2	21.8	50 22.0	15.0	50 16.1	36.6	318 50.7	01.0	356 19.7	137	7 49.6	-122				
	17	196 38.5	84 27.4	21.4	65 22.8	14.5	65 18.0	36.5	333 53.1	01.0	10 52.4	136	8 01.8	-120				
	18	211 41.0	99 26.5	+22 21.0	80 23.7	+19 14.1	80 19.9	+18 36.3	348 55.6	-14 01.0	25 25.0	137	- 8 13.8	-120				
	19	226 43.5	114 25.7	20.7	95 24.5	13.7	95 21.8	36.2	3 58.0	01.0	39 57.7	137	8 25.8	-120				
	20	241 45.9	129 24.9	20.3	110 25.3	13.3	110 23.7	36.0	19 00.5	01.1	54 30.4	136	8 37.8	-119				
	21	256 48.4	144 24.1	.. 19.9	125 26.2	.. 12.9	125 25.6	.. 35.9	34 02.9	.. 01.1	69 03.0	137	8 49.7	-119				
	22	271 50.9	159 23.2	19.6	140 27.0	12.4	140 27.5	35.8	49 05.4	01.1	83 35.7	137	9 01.6	-118				
	23	286 53.3	174 22.4	19.2	155 27.8	12.0	155 29.4	35.6	64 07.8	01.1	98 08.4	137	9 13.4	-117				
25	0	301 55.8	189 21.6	+22 18.8	170 28.7	+19 11.6	170 31.3	+18 35.5	79 10.3	-14 01.1	112 41.1	137	- 9 25.1	-117				
	1	316 58.3	204 20.7	18.4	185 29.5	11.2	185 33.2	35.3	94 12.7	01.1	127 13.8	137	9 36.8	-116				
	2	332 00.7	219 19.9	18.1	200 30.3	10.8	200 35.1	35.2	109 15.1	01.2	141 46.5	137	9 48.4	-116				
	3	347 03.2	234 19.1	.. 17.7	215 31.2	.. 10.4	215 37.0	.. 35.0	124 17.6	.. 01.2	156 19.2	136	10 00.0	-115				
	4	2 05.7	249 18.3	17.3	230 32.0	09.9	230 38.9	34.9	139 20.0	01.2	170 51.8	137	10 11.5	-115				
	5	17 08.1	264 17.4	16.9	245 32.8	09.5	245 40.8	34.8	154 22.5	01.2	185 24.5	137	10 23.0	-114				
	6	32 10.6	279 16.6	+22 16.5	260 33.7	+19 09.1	260 42.7	+18 34.6	169 24.9	-14 01.2	199 57.2	137	-10 34.4	-113				
	7	47 13.0	294 15.8	16.2	275 34.5	08.7	275 44.7	34.5	184 27.4	01.2	214 29.9	137	10 45.7	-113				
	8	62 15.5	309 14.9	15.8	290 35.3	08.3	290 46.6	34.3	199 29.8	01.3	229 02.6	136	10 57.0	-113				
	9	77 18.0	324 14.1	.. 15.4	305 36.2	.. 07.8	305 48.5	.. 34.2	214 32.2	.. 01.3	243 35.2	137	11 08.3	-111				
	10	92 20.4	339 13.3	15.0	320 37.0	07.4	320 50.4	34.1	229 34.7	01.3	258 07.9	137	11 19.4	-111				
	11	107 22.9	354 12.5	14.6	335 37.8	07.0	335 52.3	33.9	244 37.1	01.3	272 40.6	136	11 30.5	-111				
	12	122 25.4	9 11.6	+22 14.2	350 38.7	+19 06.6	350 54.2	+18 33.8	259 39.6	-14 01.3	287 13.2	137	-11 41.6	-109				
	13	137 27.8	24 10.8	13.8	5 39.5	06.1	5 56.1	33.6	274 42.0	01.4	301 45.9	136	11 52.5	-109				
	14	152 30.3	39 10.0	13.4	20 40.3	05.7	20 58.0	33.5	289 44.5	01.4	316 18.5	136	12 03.4	-109				
	15	167 32.8	54 09.2	.. 13.1	35 41.2	.. 05.3	35 59.9	.. 33.3	304 46.9	.. 01.4	330 51.1	136	12 14.3	-108				
	16	182 35.2	69 08.3	12.7	50 42.0	04.9	51 01.8	33.2	319 49.3	01.4	345 23.7	137	12 25.1	-107				
	17	197 37.7	84 07.5	12.3	65 42.8	04.5	66 03.7	33.1	334 51.8	01.4	359 56.4	136	12 35.8	-106				
	18	212 40.2	99 06.7	+22 11.9	80 43.7	+19 04.0	81 05.6	+18 32.9	349 54.2	-14 01.4	14 29.0	135	-12 46.4	-106				
	19	227 42.6	114 05.9	11.5	95 44.5	03.6	96 07.5	32.8	4 56.7	01.5	29 01.5	136	12 57.0	-105				
	20	242 45.1	129 05.0	11.1	110 45.4	03.2	111 09.4	32.6	19 59.1	01.5	43 34.1	136	13 07.5	-105				
	21	257 47.5	144 04.2	.. 10.7	125 46.2	.. 02.8	126 11.3	.. 32.5	35 01.5	.. 01.5	58 06.7	135	13 18.0	-104				
	22	272 50.0	159 03.4	10.3	140 47.0	02.3	141 13.2	32.3	50 04.0	01.5	72 39.2	136	13 28.4	-103				
	23	287 52.5	174 02.6	09.9	155 47.9	01.9	156 15.1	32.2	65 06.4	01.5	87 11.8	135	13 38.7	-102				
26	0	302 54.9	189 01.7	+22 09.5	170 48.7	+19 01.5	171 17.0	+18 32.1	80 08.9	-14 01.6	101 44.3	135	-13 48.9	-102				
	1	317 57.4	204 00.9	09.1	185 49.5	01.1	186 18.9	31.9	95 11.3	01.6	116 16.8	135	13 59.1	-101				
	2	332 59.9	219 00.1	08.7	200 50.4	00.6	201 20.8	31.8	110 13.8	01.6	130 49.3	134	14 09.2	-100				
	3	348 02.3	233 59.3	.. 08.3	215 51.2	.. 19 00.2	216 22.7	.. 31.6	125 16.2	.. 01.6	145 21.7	135	14 19.2	-100				
	4	3 04.8	248 58.5	07.9	230 52.0	18 59.8	231 24.6	31.5	140 18.6	01.6	159 54.2	134	14 29.2	-98				
	5	18 07.3	263 57.6	07.4	245 52.9	59.4	246 26.6	31.4	155 21.1	01.6	174 26.6	135	14 39.0	-98				
	6	33 09.7	278 56.8	+22 07.0	260 53.7	+18 58.9	261 28.5	+18 31.2	170 23.5	-14 01.7	188 59.1	134	-14 48.8	-98				
	7	48 12.2	293 56.0	06.6	275 54.6	58.5	276 30.4	31.1	185 26.0	01.7	203 31.5	134	14 58.6	-96				
	8	63 14.6	308 55.2	06.2	290 55.4	58.1	291 32.3	30.9	200 28.4	01.7	218 03.9	133	15 08.2	-96				
	9	78 17.1	323 54.3	.. 05.8	305 56.2	.. 57.7	306 34.2	.. 30.8	215 30.8	.. 01.7	232 36.2	134	15 17.8	-95				
	10	93 19.6	338 53.5	05.4	320 57.1	57.2	321 36.1	30.6	230 33.3	01.7	247 08.6	133	15 27.3	-95				
	11	108 22.0	353 52.7	05.0	335 57.9	56.8	336 38.0	30.5	245 35.7	01.8	261 40.9	133	15 36.8	-93				
	12	123 24.5	8 51.9	+22 04.6	350 58.8	+18 56.4	351 39.9	+18 30.4	260 38.1	-14 01.8	276 13.2	133	-15 46.1	-93				
	13	138 27.0	23 51.1	04.1	5 59.6	56.0	6 41.8	30.2	275 40.6	01.8	290 45.5	132	15 55.4	-92				
	14	153 29.4	38 50.2	03.7	21 00.4	55.5	21 43.7	30.1	290 43.0	01.8	305 17.7	133	16 04.6	-91				
	15	168 31.9	53 49.4	.. 03.3	36 01.3	.. 55.1	36 45.6	.. 29.9	305 45.5	.. 01.8	319 50.0	132	16 13.7	-91				
	16	183 34.4	68 48.6	02.9	51 02.1	54.7	51 47.5	29.8	320 47.9	01.9	334 22.2	132	16 22.8	-90				
	17	198 36.8	83 47.8	02.5	66 02.9	54.2	66 49.4	29.6	335 50.3	01.9	348 54.4	132	16 31.8	-88				
	18	213 39.3	98 47.0	+22 02.0	81 03.8	+18 53.8	81 51.3	+18 29.5	350 52.8	-14 01.9	3 26.6	131	-16 40.6	-89				
	19	228 41.8	113 46.2	01.6	96 04.6	53.4	96 53.2	29.4	5 55.2	01.9	17 58.7	131	16 49.5	-87				
	20	243 44.2	128 45.3	01.2	111 05.5	53.0	111 55.1	29.2	20 57.6	01.9	32 30.8	131	16 58.2	-8				

G M T	SUN			STARS			Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS			
	GHA	Dec.	No.	Name	SHA	Dec.				24	25	26	27	Alt.	Sun's Low'r Limb Add	Venus Add	Mars Add
24	0	178 24.4	+20 04.9	7	Acamar	315 51.3	-40 28.6	72	0	0	11 36	13 39	16 05	0	0	0	
	1	193 24.4	04.4	5	Achernar	335 58.8	-57 27.3	70	0	0	11 25	13 17	15 16	0	0	0	
	2	208 24.4	03.9	30	Acrux	173 58.2	-62 51.5	68	1 30	///	11 17	13 00	14 46	16 40	0	0	
	3	223 24.3	03.4	19	Adhara	255 47.0	-28 54.6	66	2 14	///	11 10	12 46	14 23	16 02	0	0	
	4	238 24.3	02.9	10	Aldebaran	291 39.4	+16 25.3	64	2 43	///	11 04	12 35	14 05	15 35	0	0	
	5	253 24.3	02.4	32	Alioth	166 58.8	+56 12.2	62	3 05	///	10 59	12 25	13 51	15 14	0	0	
	6	268 24.3	+20 01.8	34	Alkaid	153 33.0	+49 32.3	60	3 23	///	10 54	12 17	13 39	14 57	0	0	
	7	283 24.3	01.3	55	Al Na'ir	28 37.6	-47 10.3	58	3 37	///	10 50	12 10	13 28	14 43	0	0	
	8	298 24.2	00.8	55	Al Na'ir	28 37.6	-47 10.3	56	3 50	///	10 47	12 04	13 19	14 31	0	0	
	9	313 24.2	-20 00.3	15	Alnilam	276 30.6	-1 13.7	54	4 00	///	10 43	11 58	13 11	14 21	0	0	
	10	328 24.2	19 59.8	25	Alphard	218 39.0	-8 28.0	52	4 10	0 27	10 41	11 53	13 04	14 12	0	0	
	11	343 24.2	59.3	41	Alphecca	126 47.6	+26 51.9	50	4 19	1 24	10 38	11 48	12 57	14 03	0	0	
	12	358 24.2	+19 58.7	1	Alpheratz	358 28.3	+28 50.8	45	4 37	2 23	10 32	11 39	12 43	13 46	0	0	
	13	13 24.2	58.2	51	Altair	62 50.2	+8 45.1	40	4 51	2 57	10 28	11 31	12 32	13 32	0	0	
	14	28 24.1	57.7	2	Ankaa	353 58.2	-42 32.4	35	5 03	3 23	10 24	11 24	12 22	13 20	0	0	
	15	43 24.1	57.2	42	Antares	113 19.3	-26 20.2	30	5 14	3 42	10 20	11 18	12 14	13 09	0	0	
	16	58 24.1	56.7	37	Arcturus	146 35.2	+19 24.9	20	5 32	4 11	10 14	11 07	11 59	12 51	0	0	
	17	73 24.1	56.2	43	Atria	108 59.7	-68 57.2	10	5 48	4 32	10 09	10 58	11 47	12 36	0	0	
	18	88 24.1	+19 55.6	22	Avior	234 36.5	-59 22.0	0	6 03	4 50	10 04	10 49	11 35	12 21	0	0	
	19	103 24.1	55.1	13	Bellatrix	279 18.8	+6 18.7	10	6 17	5 04	10 00	10 41	11 23	12 07	0	0	
	20	118 24.1	54.6	16	Betelge'se	271 48.5	+7 24.1	20	6 33	5 16	9 54	10 32	11 11	11 51	0	0	
	21	133 24.0	54.1	17	Canopus	264 15.9	-52 40.1	30	6 50	5 28	9 49	10 22	10 57	11 34	0	0	
	22	148 24.0	53.5	12	Capella	281 38.9	+45 57.2	35	7 00	5 33	9 45	10 16	10 48	11 23	0	0	
	23	163 24.0	53.0	50	Deneb	50 00.6	+45 07.4	40	7 12	5 38	9 42	10 10	10 39	11 12	0	0	
				58	Denebola	183 18.0	+14 49.3	45	7 26	5 43	9 37	10 02	10 29	10 58	0	0	
				56	Diphda	349 39.2	-18 13.5	52	7 50	5 51	9 30	9 49	10 10	10 34	0	0	
				58	Dubhe	194 45.2	+61 59.6	54	7 58	5 53	9 28	9 44	10 03	10 25	0	0	
				60	Elanath	279 07.7	+28 34.3	56	8 08	5 55	9 25	9 39	9 56	10 16	0	0	
				58	Eltanin	91 05.8	+51 29.8	58	8 19	5 58	9 22	9 33	9 47	10 05	0	0	
				60	Enif	34 29.4	+9 40.4	S	8 32	6 00	9 18	9 27	9 38	9 52	0	0	
				56	Fomalhaut	16 11.4	-29 51.2										
				31	Gacrux	172 49.6	-56 52.2										
				29	Gienah	176 37.1	-17 17.9										
				35	Hadar	149 49.6	-60 09.9										
				6	Hamal	328 49.8	+23 15.2										
				48	Kaus Aust.	84 40.9	-34 24.4										
				40	Kochab	137 17.6	+74 20.5										
				57	Markab	14 21.3	+14 58.1										
				8	Menkar	315 00.5	+3 55.1										
				36	Menkent	148 58.8	-36 09.4										
				24	Miapl'dus	221 50.0	-69 32.2										
				9	Mirfak	309 42.7	+49 42.2										
				50	Nunki	76 51.7	-26 21.2										
				52	Peacock	54 26.8	-56 52.6										
				21	Pollux	244 21.1	+28 08.1										
				20	Procyon	245 45.4	+5 20.4										
				46	R'alhague	96 46.4	+12 35.6										
				26	Regulus	208 29.9	+12 11.1										
				11	Rigel	281 54.0	-8 15.0										
				38	Rigel Kent.	140 51.0	-60 39.6										
				44	Sapik	103 02.0	-15 40.3										
				3	Schedar	350 29.9	+56 17.5										
				45	Shaula	97 20.5	-37 04.5										
				18	Sirius	259 12.3	-16 39.2										
				33	Spica	159 17.0	-10 55.9										
				23	Suhail	223 24.8	-43 15.2										
				49	Vega	81 07.9	+38 44.6										
				39	Zub'g'bi	137 53.4	-15 51.6										
								S									

G M T	°	VENUS - 3.4		MARS 2.0		JUPITER - 1.3		SATURN 0.7		MOON			
		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
h	o	o	o	o	o	o	o	o	o	o	o	o	o
27	0	303 54.1	188 42.1	+21 59.5	171 08.8	+18 51.2	172 02.7	+18 28.6	81 07.4	-14 02.0	90 39.1	130	-17 32.3 - 83
1	1	318 56.5	203 41.3	59.1	186 09.7	50.8	187 04.6	28.5	96 09.8	02.0	105 11.1	130	17 40.6 - 82
2	2	333 59.0	218 40.4	58.6	201 10.5	50.4	202 06.5	28.4	111 12.3	02.0	119 43.1	129	17 48.8 - 82
3	3	349 01.5	233 39.6	.. 58.2	216 11.3	.. 49.9	217 08.4	.. 28.2	126 14.7	.. 02.1	134 15.0	129	-17 57.0 - 80
4	4	4 03.9	248 38.8	57.8	231 12.2	49.5	232 10.3	28.1	141 17.1	02.1	148 46.9	129	18 05.0 - 80
5	5	19 06.4	263 38.0	57.3	246 13.0	49.1	247 12.3	27.9	156 19.6	02.1	163 18.8	129	18 13.0 - 79
6	6	34 08.9	278 37.2	+21 56.9	261 13.9	+18 48.7	262 14.2	+18 27.8	171 22.0	-14 02.1	177 50.7	128	-18 20.9 - 78
7	7	49 11.3	293 36.4	56.5	276 14.7	48.2	277 16.1	27.6	186 24.4	02.1	192 22.5	128	18 28.7 - 77
8	8	64 13.8	308 35.6	56.0	291 15.6	47.8	292 18.0	27.5	201 26.9	02.2	206 54.3	128	18 36.4 - 77
9	9	79 16.2	323 34.7	.. 55.6	306 16.4	.. 47.4	307 19.9	.. 27.3	216 29.3	.. 02.2	221 26.1	128	-18 44.1 - 75
10	10	94 18.7	338 33.9	55.1	321 17.2	46.9	322 21.8	27.2	231 31.8	02.2	235 57.9	127	18 51.6 - 75
11	11	109 21.2	353 33.1	54.7	336 18.1	46.5	337 23.7	27.1	246 34.2	02.2	250 29.6	127	18 59.1 - 73
12	12	124 23.6	8 32.3	+21 54.3	351 18.9	+18 46.1	352 25.6	+18 26.9	261 36.6	-14 02.3	265 01.3	127	-19 06.4 - 73
13	13	139 26.1	23 31.5	53.8	6 19.8	45.6	7 27.5	26.8	276 39.1	02.3	279 33.0	126	19 13.7 - 72
14	14	154 28.6	38 30.7	53.4	21 20.6	45.2	22 29.4	26.6	291 41.5	02.3	294 04.6	127	19 20.9 - 71
15	15	169 31.0	53 29.9	.. 52.9	36 21.5	.. 44.8	37 31.3	.. 26.5	306 43.9	.. 02.3	308 36.3	126	-19 28.0 - 70
16	16	184 33.5	68 29.1	52.5	51 22.3	44.3	52 33.2	26.3	321 46.4	02.3	323 07.8	125	19 35.0 - 69
17	17	199 36.0	83 28.3	52.0	66 23.1	43.9	67 35.1	26.2	336 48.8	02.4	337 39.4	125	19 41.9 - 68
18	18	214 38.4	98 27.4	+21 51.6	81 24.0	+18 43.5	82 37.0	+18 26.1	351 51.2	-14 02.4	352 10.9	125	-19 48.7 - 68
19	19	229 40.9	113 26.6	51.1	96 24.8	43.0	97 38.9	25.9	6 53.7	02.4	6 42.4	125	19 55.5 - 66
20	20	244 43.4	128 25.8	50.7	111 25.7	42.6	112 40.8	25.8	21 56.1	02.4	21 13.9	125	20 02.1 - 66
21	21	259 45.8	143 25.0	.. 50.2	126 26.5	.. 42.2	127 42.7	.. 25.6	36 58.5	.. 02.4	35 45.4	124	-20 08.7 - 64
22	22	274 48.3	158 24.2	49.8	141 27.4	41.7	142 44.6	25.5	52 01.0	02.5	50 16.8	124	20 15.1 - 64
23	23	289 50.7	173 23.4	49.3	156 28.2	41.3	157 46.5	25.3	67 03.4	02.5	64 48.2	123	20 21.5 - 62
28	0	304 53.2	188 22.6	+21 48.9	171 29.0	+18 40.9	172 48.4	+18 25.2	82 05.8	-14 02.5	79 19.5	123	-20 27.7 - 62
1	1	319 55.7	203 21.8	48.4	186 29.9	40.4	187 50.3	25.0	97 08.3	02.5	93 50.8	123	20 33.9 - 61
2	2	334 58.1	218 21.0	48.0	201 30.7	40.0	202 52.2	24.9	112 10.7	02.5	108 22.1	123	20 40.0 - 60
3	3	350 00.6	233 20.2	.. 47.5	216 31.6	.. 39.6	217 54.1	.. 24.8	127 13.1	.. 02.6	122 53.4	122	-20 46.0 - 58
4	4	5 03.1	248 19.4	47.0	231 32.4	39.1	232 56.0	24.6	142 15.6	02.6	137 24.6	123	20 51.8 - 58
5	5	20 05.5	263 18.5	46.6	246 33.3	38.7	247 58.0	24.5	157 18.0	02.6	151 55.9	121	20 57.6 - 57
6	6	35 08.0	278 17.7	+21 46.1	261 34.1	+18 38.2	262 59.9	+18 24.3	172 20.4	-14 02.6	166 27.0	122	-21 03.3 - 56
7	7	50 10.5	293 16.9	45.6	276 35.0	37.8	278 01.8	24.2	187 22.8	02.6	180 58.2	121	21 08.9 - 55
8	8	65 12.9	308 16.1	45.2	291 35.8	37.4	293 03.7	24.0	202 25.3	02.7	195 29.3	121	21 14.4 - 54
9	9	80 15.4	323 15.3	.. 44.7	306 36.7	.. 36.9	308 05.6	.. 23.9	217 27.7	.. 02.7	210 00.4	121	-21 19.8 - 53
10	10	95 17.9	338 14.5	44.2	321 37.5	36.5	323 07.5	23.8	232 30.1	02.7	224 31.5	120	21 25.1 - 52
11	11	110 20.3	353 13.7	43.8	336 38.3	36.1	338 09.4	23.6	247 32.6	02.7	239 02.5	120	21 30.3 - 51
12	12	125 22.8	8 12.9	+21 43.3	351 39.2	+18 35.6	353 11.3	+18 23.5	262 35.0	-14 02.8	253 33.5	120	-21 35.4 - 50
13	13	140 25.2	23 12.1	42.8	6 40.0	35.2	8 13.2	23.3	277 37.4	02.8	268 04.5	120	21 40.4 - 49
14	14	155 27.7	38 11.3	42.4	21 40.9	34.7	23 15.1	23.2	292 39.9	02.8	282 35.5	119	21 45.3 - 48
15	15	170 30.2	53 10.5	.. 41.9	36 41.7	.. 34.3	38 17.0	.. 23.0	307 42.3	.. 02.8	297 06.4	119	-21 50.1 - 47
16	16	185 32.6	68 09.7	41.4	51 42.6	33.9	53 18.9	22.9	322 44.7	02.8	311 37.3	119	21 54.8 - 46
17	17	200 35.1	83 08.9	41.0	66 43.4	33.4	68 20.8	22.7	337 47.2	02.9	326 08.2	119	21 59.4 - 45
18	18	215 37.6	98 08.1	+21 40.5	81 44.3	+18 33.0	83 22.7	+18 22.6	352 49.6	-14 02.9	340 39.1	118	-22 03.9 - 44
19	19	230 40.0	113 07.3	40.0	96 45.1	32.6	98 24.6	22.5	7 52.0	02.9	355 09.9	118	22 08.3 - 43
20	20	245 42.5	128 06.5	39.5	111 46.0	32.1	113 26.5	22.3	22 54.4	02.9	9 40.7	118	22 12.6 - 41
21	21	260 45.0	143 05.7	.. 39.0	126 46.8	.. 31.7	128 28.4	.. 22.2	37 56.9	.. 02.9	24 11.5	117	-22 16.7 - 41
22	22	275 47.4	158 04.9	38.6	141 47.7	31.2	143 30.3	22.0	52 59.3	03.0	38 42.2	117	22 20.8 - 40
23	23	290 49.9	173 04.1	38.1	156 48.5	30.8	158 32.2	21.9	68 01.7	03.0	53 12.9	117	22 24.8 - 39
29	0	305 52.4	188 03.3	+21 37.6	171 49.4	+18 30.4	173 34.1	+18 21.7	83 04.2	-14 03.0	67 43.6	117	-22 28.7 - 38
1	1	320 54.8	203 02.5	37.1	186 50.2	29.9	188 36.0	21.6	98 06.6	03.0	82 14.3	116	22 32.5 - 36
2	2	335 57.3	218 01.7	36.6	201 51.1	29.5	203 37.9	21.4	113 09.0	03.1	96 44.9	117	22 36.1 - 36
3	3	350 59.7	233 00.9	.. 36.1	216 51.9	.. 29.0	218 39.9	.. 21.3	128 11.4	.. 03.1	111 15.6	116	-22 39.7 - 34
4	4	6 02.2	248 00.1	35.7	231 52.7	28.6	233 41.8	21.2	143 13.9	03.1	125 46.2	115	22 43.1 - 34
5	5	21 04.7	262 59.3	35.2	246 53.6	28.2	248 43.7	21.0	158 16.3	03.1	140 16.7	116	22 46.5 - 32
6	6	36 07.1	277 58.5	+21 34.7	261 54.4	+18 27.7	263 45.6	+18 20.9	173 18.7	-14 03.1	154 47.3	115	-22 49.7 - 32
7	7	51 09.6	292 57.7	34.2	276 55.3	27.3	278 47.5	20.7	188 21.2	03.2	169 17.8	115	22 52.9 - 30
8	8	66 12.1	307 56.9	33.7	291 56.1	26.8	293 49.4	20.6	203 23.6	03.2	183 48.3	115	22 55.9 - 29
9	9	81 14.5	322 56.1	.. 33.2	306 57.0	.. 26.4	308 51.3	.. 20.4	218 26.0	.. 03.2	198 18.8	115	-22 58.8 - 29
10	10	96 17.0	337 55.3	32.7	321 57.8	25.9	323 53.2	20.3	233 28.4	03.2	212 49.3	114	23 01.7 - 27
11	11	111 19.5	352 54.5	32.2	336 58.7	25.5	338 55.1	20.1	248 30.9	03.3	227 19.7	115	23 04.4 - 26
12	12	126 21.9	7 53.7	+21 31.7	351 59.5	+18 25.1	353 57.0	+18 20.0	263 33.3	-14 03.3	241 50.2	114	-23 07.0 - 25
13	13	141 24.4	22 52.9	31.2	7 00.4	24.6	8 58.9	19.9	278 35.7	03.3	256 20.6	114	23 09.5 - 24
14	14	156 26.9	37 52.1	30.7	22 01.2	24.2	24 00.8	19.7	293 38.1	03.3	270 51.0	113	23 11.9 - 22
15	15	171 29.3	52 51.3	.. 30.2	37 02.1	.. 23.7	39 02.7	.. 19.6	308 40.6	.. 03.3	285 21.3	114	-23 14.1 - 22
16	16	186 31.8	67 50.5	29.7	52 02.9	23.3	54 04.6	19.4	323 43.0	03.4	299 51.7	113	23 16.3 - 21
17	17	201 34.2	82 49.7	29.2	67 03.8	22.8	69 06.5	19.3	338 45.4	03.4	314 22.0	113	23 18.4 - 19
18	18	216 36.7	97 48.9	+21 28.7	82 04.6	+18 22.4	84 08.4	+18 19.1	353 47.8	-14 03.4	328 52.3	113	-23 20.3 - 19
19	19	231 39.2	112 48.1	28.2	97 05.5	22.0	99 10.3	19.0	8 50.3	03.4	343 22.6	113	23 22.2 - 17
20	20	246 41.6	127 47.3	27.7	112 06.3	21.5	114 12.2	18.8	23 52.7	03.5	357 52.9	113	23 23.9 - 16
21	21	261 44.1	142 46.5	.. 27.2	127 07.2	.. 21.1	129 14.1	.. 18.7	38 55.1	.. 03.5	12 23.2	112	-23 25.5 - 16
22	22	276 46.6	157 45.7	26.7	142 08.0	20.6	144 16.0	18.5	53 57.5	03.5	26 53.4	113	23 27.1 - 14
23	23	291 49.0	172 45.0	26.2	157 08.9	20.2	159 17.9	18.4	69 00.0	03.5	41 23.7	112	23 28.5 - 13
24	24	306 51.5	187 44.2	+21 25.7	172 09.7	+18 19.7	174 19.9	+18 18.3	84 02.4	-14 03.6	55 53.9	112	-23 29.8 - 12
code		-	- 8	- 5	+ 8	- 4	+ 19	- 2	+ 24	0			

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS			
	GHA	Dec.	No.	Name	SHA	Dec.											
										27	28	29	30	Alt.	Sun's Low'r Limb	Venus	Mars
h	°	°					N	h m	h m	h m	h m	h m	h m	°	'	'	'
27	0	178 23.7	+19 26.6	7	Acamar	315 51.3	-40 28.6	72	□	□	■	■	■	Alt.			
	1	193 23.7	26.1	5	Achernar	335 58.8	-57 27.3	70	□	□	■	■	■	Alt.			
	2	208 23.7	25.5	30	Acrux	173 58.3	-62 51.5	68	1 49	///	16 40	17 41	19 16	0	'	'	'
	3	223 23.7	25.0	19	Adhara	255 47.0	-28 54.6	66	2 26	///	16 02	17 41	19 16	30	0.1	0.1	0.1
	4	238 23.7	24.4	10	Aldebaran	291 39.4	+16 25.3	64	2 53	///	15 35	17 01	18 16	45	0.1	0.1	0.0
	5	253 23.7	23.9					62	3 13	///	15 14	16 33	17 42	60	0.1	0.0	0.0
	6	268 23.7	+19 23.3	32	Alioth	166 58.8	+56 12.2	60	3 29	///	14 57	16 12	17 18	75	0.1	0.0	0.0
	7	283 23.7	22.8	34	Alkaid	153 33.0	+49 32.3	58	3 43	///	14 43	15 55	16 58	90	0.1	0.0	0.0
	8	298 23.7	22.2	55	Al Na'ir	28 37.6	-47 10.3	56	3 55	///	14 31	15 40	16 42				
	9	313 23.7	21.7	15	Alnilam	276 30.6	-1 13.6	54	4 05	///	14 21	15 27	16 28				
	10	328 23.7	21.1	25	Alphard	218 39.0	-8 28.0	52	4 14	0 54	14 12	15 16	16 16				
	11	343 23.7	20.5					50	4 23	1 35	14 03	15 07	16 05				
	12	358 23.7	+19 20.0	41	Alphecca	126 47.6	+26 51.9	45	4 40	2 29	13 46	14 46	15 43	Moon's Lower Limb			
	13	13 23.7	19.4	1	Alpheratz	358 28.2	+28 50.8	40	4 54	3 02	13 32	14 30	15 25	Add			
	14	28 23.7	18.9	51	Altair	62 50.2	+8 45.1	35	5 06	3 26	13 20	14 16	15 09	Alt.	27	28	29
	15	43 23.7	18.3	2	Ankaa	353 58.2	-42 32.4	30	5 16	3 44	13 09	14 04	14 56	0	'	'	'
	16	58 23.7	17.7	42	Antares	113 19.3	-26 20.2	20	5 34	4 13	12 51	13 43	14 34	4	12.5	12.1	12.0
	17	73 23.7	17.2					10	5 49	4 34	12 36	13 25	14 15	8	12.5	12.2	12.0
	18	88 23.7	+19 16.6	37	Arcturus	146 35.2	+19 24.9	0	6 03	4 50	12 21	13 08	13 57	12	12.6	12.2	12.1
	19	103 23.7	16.1	43	Atria	108 59.7	-68 57.2	10	6 17	5 04	12 07	12 52	13 39	16	12.6	12.2	12.1
	20	118 23.7	15.5	22	Avior	234 36.5	-59 22.0	20	6 32	5 15	11 51	12 34	13 20	20	12.7	12.3	12.2
	21	133 23.7	14.9	13	Bellatrix	279 18.8	+6 18.7	30	6 49	5 26	11 34	12 14	12 58	24	12.7	12.4	12.3
	22	148 23.7	14.4	16	Bete'lge	271 48.5	+7 24.1	35	6 58	5 31	11 23	12 02	12 45	28	12.8	12.5	12.4
	23	163 23.7	13.8					40	7 09	5 36	11 12	11 48	12 30	32	12.9	12.6	12.5
				17	Canopus	264 15.9	-52 40.1	45	7 22	5 40	10 58	11 32	12 13	36	13.0	12.7	12.6
28	0	178 23.7	+19 13.2	12	Capella	281 38.9	+45 57.2	50	7 38	5 45	10 42	11 13	11 51	40	13.1	12.8	12.7
	1	193 23.7	12.7	53	Deneb	50 00.6	+45 07.4	52	7 45	5 48	10 34	11 03	11 41	44	13.2	12.9	12.8
	2	208 23.8	12.1	28	Denebola	183 18.0	+14 49.3	54	7 54	5 49	10 25	10 53	11 29	48	13.4	13.1	13.0
	3	223 23.8	11.5	4	Diphda	349 39.2	-18 13.5	56	8 03	5 52	10 16	10 41	11 15	52	13.5	13.2	13.1
	4	238 23.8	11.0					58	8 13	5 53	10 05	10 28	11 00	56	13.6	13.4	13.3
	5	253 23.8	10.4	27	Dubhe	194 45.2	+61 59.6	60	8 25	5 55	9 52	10 12	10 41	60	13.8	13.5	13.4
	6	268 23.8	+19 09.8	14	El Nath	279 07.7	+28 34.3							64	13.9	13.7	13.6
	7	283 23.8	09.3	47	Eltanin	91 05.8	+51 29.8							68	14.1	13.9	13.8
	8	298 23.8	08.7	54	Enif	34 29.4	+9 40.4							72	14.2	14.1	14.0
	9	313 23.8	08.1	56	Fomalhaut	16 11.4	-29 51.2							76	14.4	14.3	14.2
	10	328 23.8	07.6											80	14.6	14.4	14.4
	11	343 23.8	07.0	31	Gacrux	172 49.6	-56 52.2							84	14.7	14.6	14.6
	12	358 23.8	+19 06.4	29	Gienah	176 37.1	-17 17.9							88	14.9	14.8	14.7
	13	13 23.8	05.8	35	Hadar	149 49.6	-60 09.9								Add to table, back cover		
	14	28 23.8	05.3	6	Hamal	328 49.7	+23 15.2										
	15	43 23.9	04.7	48	Kaus Aust.	84 40.9	-34 24.5								Moon's Upper Limb Subtract		
	16	58 23.9	04.1														
	17	73 23.9	03.6	40	Kochab	137 17.7	+74 20.5							Alt.	27	28	29
	18	88 23.9	+19 03.0	57	Markab	14 21.3	+14 58.1							0	'	'	'
	19	103 23.9	02.4	8	Menkar	315 00.5	+3 55.1							4	17.3	17.5	17.6
	20	118 23.9	01.8	36	Menkent	148 58.8	-36 09.4							8	17.3	17.5	17.5
	21	133 23.9	01.3	24	Miap'l'dus	221 50.0	-69 32.2							12	17.2	17.4	17.5
	22	148 23.9	00.7											16	17.2	17.4	17.5
	23	163 23.9	19 00.1	9	Mirfak	309 42.7	+49 42.2							20	17.1	17.3	17.4
				50	Nunki	76 51.7	-26 21.2							24	17.1	17.2	17.3
				52	Peacock	54 26.8	-56 52.6							28	17.0	17.2	17.2
29	0	178 24.0	+18 59.5	21	Pollux	244 21.1	-28 08.1							32	16.9	17.1	17.1
	1	193 24.0	58.9	20	Procyon	245 45.4	+5 20.4							36	16.8	16.9	17.0
	2	208 24.0	58.4											40	16.7	16.8	16.9
	3	223 24.0	57.8	46	R'alhague	96 46.4	+12 35.6							44	16.6	16.7	16.7
	4	238 24.0	57.2	26	Regulus	208 29.9	+12 11.1							48	16.4	16.6	16.6
	5	253 24.0	56.6	11	Rigel	281 54.0	-8 15.0							52	16.3	16.4	16.4
	6	268 24.0	+18 56.0	38	Rigil Kent.	140 51.1	-60 39.6							56	16.2	16.2	16.3
	7	283 24.1	55.5	44	Sabik	103 02.0	-15 40.3							60	16.0	16.1	16.1
	8	298 24.1	54.9											64	15.9	15.9	15.9
	9	313 24.1	54.3	3	Schedar	350 29.9	+56 17.5							68	15.7	15.7	15.7
	10	328 24.1	53.7	45	Shaula	97 20.5	-37 04.5							72	15.6	15.6	15.6
	11	343 24.1	53.1	18	Sirius	259 12.2	-16 39.1							76	15.4	15.4	15.4
	12	358 24.1	+18 52.5	33	Spica	159 17.1	-10 55.9							80	15.2	15.2	15.2
	13	13 24.1	52.0	23	Suhail	223 24.8	-43 15.2							84	15.1	15.0	15.0
	14	28 24.2	51.4											88	14.9	14.9	14.8
	15	43 24.2	50.8	49	Vega	81 07.9	+38 44.7							90	Subtract from table, back cover		
	16	58 24.2	50.2	39	Zub'g'bi	137 53.4	-15 51.6										
	17	73 24.2	49.6														
	18	88 24.2	+18 49.0														
	19	103 24.2	48.4														
	20	118 24.3	47.8														
	21	133 24.3	47.3														
	22	148 24.3	46.7														
	23	163 24.3	46.1														
	24	178 24.3	+18 45.5														
code	-	-	-														

G M T	T GHA	VENUS — 3.4		MARS 2.0		JUPITER — 1.3		SATURN 0.7		MOON			
		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
h	o	o	o	o	o	o	o	o	o	o	o	o	o
30	0	306 51.5	187 44.2	+21 25.7	172 09.7	+18 19.7	174 19.9	+18 18.3	84 02.4	-14 03.6	55 53.9	112 -23 29.8	- 12
	1	321 54.0	202 43.4	25.2	187 10.6	19.3	189 21.8	18.1	99 04.8	03.6	70 24.1	112 23 31.0	- 10
	2	336 56.4	217 42.6	24.7	202 11.5	18.8	204 23.7	18.0	114 07.2	03.6	84 54.3	112 23 32.0	- 10
	3	351 58.9	232 41.8	.. 24.2	217 12.3	.. 18.4	219 25.6	.. 17.8	129 09.7	.. 03.6	99 24.5	111 -23 33.0	- 8
	4	7 01.3	247 41.0	23.7	232 13.2	17.9	234 27.5	17.7	144 12.1	03.6	113 54.6	112 23 33.8	- 8
	5	22 03.8	262 40.2	23.1	247 14.0	17.5	249 29.4	17.5	159 14.5	03.7	128 24.8	112 23 34.6	- 6
	6	37 06.3	277 39.4	+21 22.6	262 14.9	+18 17.1	264 31.3	+18 17.4	174 16.9	-14 03.7	142 55.0	111 -23 35.2	- 5
	7	52 08.7	292 38.6	22.1	277 15.7	16.6	279 33.2	17.2	189 19.4	03.7	157 25.1	111 23 35.7	- 5
	8	67 11.2	307 37.8	21.6	292 16.6	16.2	294 35.1	17.1	204 21.8	03.7	171 55.2	112 23 36.2	- 3
	9	82 13.7	322 37.0	.. 21.1	307 17.4	.. 15.7	309 37.0	.. 17.0	219 24.2	.. 03.8	186 25.4	111 -23 36.5	- 1
	10	97 16.1	337 36.3	20.6	322 18.3	15.3	324 38.9	16.8	234 26.6	03.8	200 55.5	111 23 36.6	- 1
	11	112 18.6	352 35.5	20.0	337 19.1	14.8	339 40.8	16.7	249 29.1	03.8	215 25.6	111 23 36.7	0
	12	127 21.1	7 34.7	+21 19.5	352 20.0	+18 14.4	354 42.7	+18 16.5	264 31.5	-14 03.8	229 55.7	111 -23 36.7	+ 2
	13	142 23.5	22 33.9	19.0	7 20.8	13.9	9 44.6	16.4	279 33.9	03.9	244 25.8	111 23 36.5	+ 2
	14	157 26.0	37 33.1	18.5	22 21.7	13.5	24 46.5	16.2	294 36.3	03.9	258 55.9	111 23 36.3	+ 4
	15	172 28.5	52 32.3	.. 18.0	37 22.5	.. 13.0	39 48.4	.. 16.1	309 38.7	.. 03.9	273 26.0	110 -23 35.9	+ 5
	16	187 30.9	67 31.5	17.4	52 23.4	12.6	54 50.3	15.9	324 41.2	03.9	287 56.0	111 23 35.4	+ 6
	17	202 33.4	82 30.7	16.9	67 24.2	12.1	69 52.2	15.8	339 43.6	04.0	302 26.1	111 23 34.8	+ 7
	18	217 35.8	97 30.0	+21 16.4	82 25.1	+18 11.7	84 54.1	+18 15.6	354 46.0	-14 04.0	316 56.2	111 -23 34.1	+ 8
	19	232 38.3	112 29.2	15.8	97 26.0	11.2	99 56.0	15.5	9 48.4	04.0	331 26.3	110 23 33.3	+ 9
	20	247 40.8	127 28.4	15.3	112 26.8	10.8	114 57.9	15.4	24 50.9	04.0	345 56.3	111 23 32.4	+ 11
	21	262 43.2	142 27.6	.. 14.8	127 27.7	.. 10.3	129 59.8	.. 15.2	39 53.3	.. 04.1	0 26.4	111 -23 31.3	+ 11
	22	277 45.7	157 26.8	14.3	142 28.5	09.9	145 01.8	15.1	54 55.7	04.1	14 56.5	110 23 30.2	+ 13
	23	292 48.2	172 26.0	13.7	157 29.4	09.4	160 03.7	14.9	69 58.1	04.1	29 26.5	111 23 28.9	+ 14
31	0	307 50.6	187 25.2	+21 13.2	172 30.2	+18 09.0	175 05.6	+18 14.8	85 00.5	-14 04.1	43 56.6	111 -23 27.5	+ 15
	1	322 53.1	202 24.5	12.7	187 31.1	08.5	190 07.5	14.6	100 03.0	04.2	58 26.7	111 23 26.0	+ 16
	2	337 55.6	217 23.7	12.1	202 31.9	08.1	205 09.4	14.5	115 05.4	04.2	72 56.8	110 23 24.4	+ 17
	3	352 58.0	232 22.9	.. 11.6	217 32.8	.. 07.6	220 11.3	.. 14.3	130 07.8	.. 04.2	87 26.8	111 -23 22.7	+ 18
	4	8 00.5	247 22.1	11.0	232 33.6	07.2	235 13.2	14.2	145 10.2	04.2	101 56.9	111 23 20.9	+ 19
	5	23 03.0	262 21.3	10.5	247 34.5	06.7	250 15.1	14.0	160 12.6	04.3	116 27.0	111 23 19.0	+ 21
	6	38 05.4	277 20.5	+21 10.0	262 35.4	+18 06.3	265 17.0	+18 13.9	175 15.1	-14 04.3	130 57.1	111 -23 16.9	+ 21
	7	53 07.9	292 19.8	09.4	277 36.2	05.8	280 18.9	13.7	190 17.5	04.3	145 27.2	111 23 14.8	+ 23
	8	68 10.3	307 19.0	08.9	292 37.1	05.4	295 20.8	13.6	205 19.9	04.3	159 57.3	111 23 12.5	+ 24
	9	83 12.8	322 18.2	.. 08.3	307 37.9	.. 04.9	310 22.7	.. 13.5	220 22.3	.. 04.3	174 27.4	111 -23 10.1	+ 25
	10	98 15.3	337 17.4	07.8	322 38.8	04.5	325 24.6	13.3	235 24.7	04.4	188 57.5	112 23 07.6	+ 26
	11	113 17.7	352 16.6	07.2	337 39.6	04.0	340 26.5	13.2	250 27.2	04.4	203 27.7	111 23 05.0	+ 27
	12	128 20.2	7 15.9	+21 06.7	352 40.5	+18 03.6	355 28.4	+18 13.0	265 29.6	-14 04.4	217 57.8	111 -23 02.3	+ 28
	13	143 22.7	22 15.1	06.1	7 41.4	03.1	10 30.3	12.9	280 32.0	04.4	232 27.9	112 22 59.5	+ 29
	14	158 25.1	37 14.3	05.6	22 42.2	02.7	25 32.2	12.7	295 34.4	04.5	246 58.1	111 22 56.6	+ 31
	15	173 27.6	52 13.5	.. 05.0	37 43.1	.. 02.2	40 34.1	.. 12.6	310 36.8	.. 04.5	261 28.2	112 -22 53.5	+ 31
	16	188 30.1	67 12.7	04.5	52 43.9	01.7	55 36.0	12.4	325 39.2	04.5	275 58.4	112 22 50.4	+ 33
	17	203 32.5	82 12.0	03.9	67 44.8	01.3	70 37.9	12.3	340 41.7	04.5	290 28.6	112 22 47.1	+ 34
	18	218 35.0	97 11.2	+21 03.4	82 45.6	+18 00.8	85 39.9	+18 12.1	355 44.1	-14 04.6	304 58.8	112 -22 43.7	+ 34
	19	233 37.5	112 10.4	02.8	97 46.5	18 00.4	100 41.8	12.0	10 46.5	04.6	319 29.0	112 22 40.3	+ 36
	20	248 39.9	127 09.6	02.3	112 47.4	17 59.9	115 43.7	11.8	25 48.9	04.6	333 59.2	113 22 36.7	+ 37
	21	263 42.4	142 08.9	.. 01.7	127 48.2	.. 59.5	130 45.6	.. 11.7	40 51.3	.. 04.7	348 29.5	112 -22 33.0	+ 38
	22	278 44.8	157 08.1	01.2	142 49.1	59.0	145 47.5	11.6	55 53.8	04.7	2 59.7	113 22 29.2	+ 39
	23	293 47.3	172 07.3	00.6	157 49.9	58.6	160 49.4	11.4	70 56.2	04.7	17 30.0	113 22 25.3	+ 41
1	0	308 49.8	187 06.5	+21 00.1	172 50.8	+17 58.1	175 51.3	+18 11.3	85 58.6	-14 04.7	32 00.3	113 -22 21.2	+ 41
	1	323 52.2	202 05.8	20 59.5	187 51.7	57.7	190 53.2	11.1	101 01.0	04.8	46 30.6	113 22 17.1	+ 42
	2	338 54.7	217 05.0	58.9	202 52.5	57.2	205 55.1	11.0	116 03.4	04.8	61 00.9	113 22 12.9	+ 44
	3	353 57.2	232 04.2	.. 58.4	217 53.4	.. 56.7	220 57.0	.. 10.8	131 05.8	.. 04.8	75 31.2	114 -22 08.5	+ 44
	4	8 59.6	247 03.4	57.8	232 54.2	56.3	235 58.9	10.7	146 08.3	04.8	90 01.6	114 22 04.1	+ 46
	5	24 02.1	262 02.7	57.2	247 55.1	55.8	251 00.8	10.5	161 10.7	04.9	104 32.0	113 21 59.5	+ 46
	6	39 04.6	277 01.9	+20 56.7	262 55.9	+17 55.4	266 02.7	+18 10.4	176 13.1	-14 04.9	119 02.3	115 -21 54.9	+ 48
	7	54 07.0	292 01.1	56.1	277 56.8	54.9	281 04.6	10.2	191 15.5	04.9	133 32.8	114 21 50.1	+ 49
	8	69 09.5	307 00.3	55.5	292 57.7	54.5	296 06.5	10.1	206 17.9	04.9	148 03.2	114 21 45.2	+ 50
	9	84 11.9	321 59.6	.. 55.0	307 58.5	.. 54.0	311 08.4	.. 09.9	221 20.3	.. 05.0	162 33.6	115 -21 40.2	+ 50
	10	99 14.4	336 58.8	54.4	322 59.4	53.5	326 10.3	09.8	236 22.7	05.0	177 04.1	115 21 35.2	+ 52
	11	114 16.9	351 58.0	53.8	338 00.2	53.1	341 12.2	09.7	251 25.2	05.0	191 34.6	115 21 30.0	+ 53
	12	129 19.3	6 57.3	+20 53.3	353 01.1	+17 52.6	356 14.1	+18 09.5	266 27.6	-14 05.0	206 05.1	115 -21 24.7	+ 54
	13	144 21.8	21 56.5	52.7	8 02.0	52.2	11 16.0	09.4	281 30.0	05.1	220 35.6	116 21 19.3	+ 55
	14	159 24.3	36 55.7	52.1	23 02.8	51.7	26 17.9	09.2	296 32.4	05.1	235 06.2	116 21 13.8	+ 56
	15	174 26.7	51 54.9	.. 51.5	38 03.7	.. 51.3	41 19.9	.. 09.1	311 34.8	.. 05.1	249 36.8	116 -21 08.2	+ 57
	16	189 29.2	66 54.2	51.0	53 04.6	50.8	56 21.8	08.9	326 37.2	05.1	264 07.4	116 21 02.5	+ 58
	17	204 31.7	81 53.4	50.4	68 05.4	50.3	71 23.7	08.8	341 39.6	05.2	278 38.0	116 20 56.7	+ 59
	18	219 34.1	96 52.6	+20 49.8	83 06.3	+17 49.9	86 25.6	+18 08.6	356 42.1	-14 05.2	293 08.6	117 -20 50.8	+ 60
	19	234 36.6	111 51.9	49.2	98 07.1	49.4	101 27.5	08.5	11 44.5	05.2	307 39.3	117 20 44.8	+ 61
	20	249 39.1	126 51.1	48.6	113 08.0	49.0	116 29.4	08.3	26 46.9	05.2	322 10.0	117 20 38.7	+ 62
	21	264 41.5	141 50.3	.. 48.1	128 08.9	.. 48.5	131 31.3	.. 08.2	41 49.3	.. 05.3	336 40.7	118 -20 32.5	+ 63
	22	279 44.0	156 49.6	47.5	143 09.7	48.0	146 33.2	08.0	56 51.7	05.3	351 11.5	117 20 26.2	+ 64
	23	294 46.4	171 48.8	46.9	158 10.6	47.6	161 35.1	07.9	71 54.1	05.3	5 42.2	118 20 19.8	+ 66
24	0	309 48.9	186 48.0	+20 46.3	173 11.4	+17 47.1	176 37.0	+18 07.7	86 56.5	-14 05.4	20 13.0	119 -20 13.2	+ 66
code	—	— 8	— 6	+ 9	— 5	+ 19	— 1	+ 24	0				

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS				
	GHA	Dec.	No.	Name	SHA	Dec.								Alt.	Sun's Lower Limb Add	Venus Add	Mars Add	
										30	31	1	2					
h	°	°			°	°	N	h	m	h	m	h	m	h	m			
30	0	178 24.3	+18 45.5	7	Acamar	315 51.2	-40 28.6	72	□	□	■	■	■	■	22 25			
	1	193 24.4	44.9	5	Achernar	335 58.8	-57 27.3	70	1 08	1 08	■	■	■	■	21 24			
	2	208 24.4	44.3	30	Acrux	173 58.3	-62 51.5	68	2 05	2 05	■	■	■	■	20 48			
	3	223 24.4	43.7	19	Adhara	255 47.0	-28 54.5	66	2 38	2 38	■	■	■	■	20 23			
	4	238 24.4	43.1	10	Aldebaran	291 39.3	+16 25.3	64	3 02	3 02	19 10	19 40	19 55	20 03	0	0	0	
	5	253 24.4	42.5					62	3 21	3 21	18 35	19 11	19 33	19 47	30	0.1	0.1	
	6	268 24.5	+18 41.9	32	Alioth	166 58.8	+56 12.2	60	3 36	3 36	18 10	18 48	19 15	19 33	45	0.1	0.1	
	7	283 24.5	41.3	34	Alkaid	153 33.0	+49 32.3	58	3 49	3 49	17 50	18 30	19 00	19 21	60	0.1	0.1	
	8	298 24.5	40.7	55	Al Na'ir	28 37.6	-47 10.3	56	4 00	4 00	17 34	18 15	18 47	19 11	75	0.1	0.0	
	9	313 24.5	40.1	15	Alnilam	276 30.6	-1 13.6	54	4 10	4 10	17 19	18 02	18 35	19 02	90	0.0	0.0	
	10	328 24.5	39.5	25	Alphard	218 39.0	-8 27.9	52	4 19	4 19	17 07	17 50	18 25	18 54				
	11	343 24.6	38.9					50	4 27	4 27	16 56	17 40	18 16	18 47				
	12	358 24.6	+18 38.4	41	Alphecca	126 47.6	+26 51.9	45	4 43	4 43	16 34	17 19	17 58	18 31	Moon's Lower Limb			
	13	13 24.6	37.8	1	Alpheratz	358 28.2	+28 50.8	40	4 57	4 57	16 15	17 01	17 42	18 18	Add			
	14	28 24.6	37.2	51	Altair	62 50.2	+8 45.1	35	5 08	5 08	16 00	16 47	17 29	18 07	Alt.	30	31	1
	15	43 24.6	36.6	2	Ankaa	353 58.1	-42 32.4	30	5 18	5 18	15 47	16 34	17 18	17 58	0	0	0	0
	16	58 24.7	36.0	42	Antares	113 19.3	-26 20.2	20	5 35	5 35	15 24	16 12	16 58	17 41	4	12.0	12.1	12.5
	17	73 24.7	35.4					10	5 49	5 49	14 34	15 04	15 53	16 41	8	12.0	12.1	12.5
	18	88 24.7	+18 34.8	37	Arcturus	146 35.3	+19 24.9	0	6 03	6 03	14 46	15 36	16 25	17 13	12	12.1	12.2	12.5
	19	103 24.7	34.2	43	Atria	108 59.7	-68 57.2	10	6 16	6 16	14 28	15 18	16 09	16 59	16	12.1	12.2	12.6
	20	118 24.8	33.6	22	Avior	234 36.5	-59 22.0	20	6 31	6 31	14 08	14 59	15 52	16 45	20	12.2	12.3	12.7
	21	133 24.8	33.0	13	Bellatrix	279 18.7	+6 18.7	30	6 47	6 47	13 46	14 37	15 32	16 28	24	12.3	12.4	12.7
	22	148 24.8	32.4	16	Betelge'se	271 48.5	+7 24.1	35	6 56	6 56	13 33	14 25	15 20	16 18	28	12.4	12.5	12.8
	23	163 24.8	31.7					40	7 07	7 07	13 17	14 10	15 07	16 07	32	12.5	12.6	12.9
31	0	178 24.9	+18 31.1	17	Canopus	264 15.9	-52 40.1	45	7 19	7 19	12 59	13 52	14 51	15 53	36	12.6	12.7	13.0
	1	193 24.9	30.5	12	Capella	281 38.9	+45 57.2	50	7 34	7 34	12 37	13 31	14 31	15 37	40	12.7	12.8	13.1
	2	208 24.9	29.9	53	Deneb	50 00.6	+45 07.4	52	7 41	7 41	12 26	13 20	14 22	15 29	44	12.8	12.9	13.2
	3	223 24.9	29.3	28	Denebola	183 18.0	+14 49.3	54	7 49	7 49	12 14	13 08	14 12	15 21	48	13.0	13.1	13.4
	4	238 25.0	28.7	4	Diphda	349 39.2	-18 13.5	56	7 58	7 58	12 00	12 55	14 00	15 11	52	13.1	13.2	13.5
	5	253 25.0	28.1					58	8 07	8 07	11 43	12 39	13 46	15 00	56	13.3	13.4	13.6
	6	268 25.0	+18 27.5	27	Dubhe	194 45.2	+61 59.6	60	8 19	8 19	11 24	12 21	13 30	14 48	60	13.5	13.5	13.8
	7	283 25.0	26.9	14	Elnath	279 07.7	+28 34.3	S							64	13.6	13.7	13.9
	8	298 25.1	26.3	47	Eltanin	91 05.9	+51 29.8								68	13.8	13.9	14.1
	9	313 25.1	25.7	54	Enif	34 29.4	+9 40.4								72	14.0	14.1	14.2
	10	328 25.1	25.1	56	Fomalhaut	16 11.4	-29 51.2								76	14.2	14.3	14.4
	11	343 25.2	24.5					N	h	m	h	m	h	m	h	m	h	m
	12	358 25.2	+18 23.9	31	Gacrux	172 49.6	-56 52.2	72	22 55	22 55	21 44	23 17	24 58	0 58	80	14.4	14.4	14.6
	13	13 25.2	23.2	29	Gienah	176 37.1	-17 17.8	70	22 03	22 03	22 48	24 00	0 00	1 27	84	14.6	14.6	14.7
	14	28 25.2	22.6	35	Hadar	149 49.6	-60 09.9	68	21 31	21 31	21 44	23 17	24 58	0 58	88	14.7	14.8	14.9
	15	43 25.3	22.0	6	Hamal	328 49.7	+23 15.2	66	21 08	21 08	22 48	24 00	0 00	1 27	Add to table, back cover			
	16	58 25.3	21.4	48	Kaus Aust.	84 40.9	-34 24.5	64	21 08	21 08	22 48	24 00	0 00	1 27				
	17	73 25.3	20.8					62	20 50	20 50	23 23	24 29	0 29	1 49				
	18	88 25.4	+18 20.2	40	Kochab	137 17.7	+74 20.5	60	20 35	20 35	23 48	24 52	0 52	2 06				
	19	103 25.4	19.6	57	Markab	14 21.3	+14 58.1	58	20 22	20 22	24 07	0 07	1 09	2 21				
	20	118 25.4	19.0	8	Menkar	315 00.5	+3 55.1	56	20 11	20 11	24 24	0 24	1 24	2 33				
	21	133 25.5	18.3	36	Menkent	148 58.8	-36 09.4	54	20 01	20 01	24 38	0 38	1 37	2 44				
	22	148 25.5	17.7	24	Miapl'dus	221 50.0	-69 32.2	52	19 53	19 53	0 00	0 00	1 49	2 54				
	23	163 25.5	17.1					50	19 45	19 45	0 11	1 01	1 59	3 02				
	1	0	178 25.5	+18 16.5	9	Mirfak	309 42.6	+49 42.2	45	19 29	19 29	0 34	1 24	2 20	3 20			
	1	193 25.6	15.9	50	Nunki	76 51.7	-26 21.2	40	19 16	19 16	0 52	1 42	2 37	3 35	4	17.6	17.5	17.3
	2	208 25.6	15.3	52	Peacock	54 26.8	-56 52.6	35	19 04	19 04	1 07	1 57	2 51	3 48	12	17.5	17.5	17.3
	3	223 25.6	14.6	21	Pollux	244 21.0	+28 08.1	30	18 55	18 55	2 10	2 10	3 03	3 58	16	17.5	17.4	17.2
	4	238 25.7	14.0	20	Procyon	245 45.4	+5 20.4	20	18 38	18 38	1 43	2 33	3 24	4 17	20	17.5	17.4	17.2
	5	253 25.7	13.4					10	18 23	18 23	2 02	2 52	3 43	4 33	24	17.4	17.3	17.1
	6	268 25.7	+18 12.8	46	R'alhague	96 46.4	+12 35.6	0	18 10	18 10	2 21	3 10	4 00	4 48	28	17.3	17.2	17.1
	7	283 25.8	12.2	26	Regulus	208 29.9	+12 11.1	10	17 57	17 57	2 39	3 28	4 16	5 03	32	17.2	17.1	16.9
	8	298 25.8	11.6	11	Rigel	281 53.9	-8 15.0	20	17 43	17 43	2 58	3 48	4 34	5 19	36	17.1	17.0	16.8
	9	313 25.8	10.9	38	Rigel Kent.	140 51.1	-60 39.6	30	17 27	17 27	3 21	4 10	4 55	5 37	40	16.9	16.8	16.7
	10	328 25.9	10.3	44	Sabik	103 02.0	-15 40.3	35	17 17	17 17	3 34	4 23	5 07	5 48	44	16.7	16.7	16.6
	11	343 25.9	09.7					40	17 07	17 07	3 49	4 38	5 21	6 00	48	16.6	16.6	16.4
	12	358 25.9	+18 09.1	3	Schedar	350 29.8	+56 17.6	45	16 54	16 54	4 07	4 55	5 38	6 14	52	16.4	16.4	16.3
	13	13 26.0	08.4	45	Shaula	97 20.5	-37 04.5	50	16 40	16 40	4 30	5 18	5 58	6 31	56	16.3	16.2	16.2
	14	28 26.0	07.8	18	Sirius	259 12.2	-16 39.1	52	16 33	16 33	4 41	5 28	6 07	6 39	60	16.1	16.1	16.0
	15	43 26.1	07.2	33	Spica	159 17.1	-10 55.9	54	16 25	16 25	4 53	5 40	6 18	6 48	64	15.9	15.9	15.9
	16	58 26.1	06.6	23	Suhail	223 24.8	-43 15.2	56	16 16	16 16	5 07	5 53	6 30	6 58	68	15.7	15.7	15.7
	17	73 26.1	05.9					58	16 06	16 06	5 23	6 09	6 44	7 09	72	15.6	15.6	15.6
	18	88 26.2	+18 05.3	49	Vega	81 07.9	+38 44.7	60	15 55	15 55	5 43	6 28	7 01	7 23	76	15.4	15.4	15.4
	19	103 26.2	04.7															

Moon's Lower Limb
Add

Alt. 30 31 1

0 12.0 12.1 12.5

4 12.0 12.1 12.5

8 12.0 12.2 12.5

12 12.1 12.2 12.6

16 12.1 12.2 12.6

20 12.2 12.3 12.7

24 12.3 12.4 12.7

28 12.4 12.5 12.8

32 12.5 12.6 12.9

36 12.6 12.7 13.0

G M T	T	VENUS - 3.4		MARS 2.0		JUPITER - 1.3		SATURN 0.8		MOON			
		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
h	o	o	o	o	o	o	o	o	o	o	o	o	o
2	0	309 48.9	186 48.0	+20 46.3	173 11.4	+17 47.1	176 37.0	+18 07.7	86 56.5	-14 05.4	20 13.0	119	-20 13.2+ 66
1	1	324 51.4	201 47.3	45.7	188 12.3	46.7	191 38.9	07.6	101 59.0	05.4	34 43.9	118	20 06.6+ 67
2	2	339 53.8	216 46.5	45.1	203 13.2	46.2	206 40.8	07.4	117 01.4	05.4	49 14.7	119	19 59.9+ 67
3	3	354 56.3	231 45.7	.. 44.5	218 14.0	.. 45.7	221 42.7	.. 07.3	132 03.8	.. 05.4	63 45.6	119	19 53.2+ 69
4	4	9 58.8	246 45.0	44.0	233 14.9	45.3	236 44.6	07.2	147 06.2	05.5	78 16.5	119	19 46.3+ 70
5	5	25 01.2	261 44.2	43.4	248 15.8	44.8	251 46.5	07.0	162 08.6	05.5	92 47.4	120	19 39.3+ 71
6	6	40 03.7	276 43.4	+20 42.8	263 16.6	+17 44.4	266 48.4	+18 06.9	177 11.0	-14 05.5	107 18.4	120	-19 32.2+ 72
7	7	55 06.2	291 42.7	42.2	278 17.5	43.9	281 50.3	06.7	192 13.4	05.5	121 49.4	120	19 25.0+ 73
8	8	70 08.6	306 41.9	41.6	293 18.3	43.4	296 52.2	06.6	207 15.8	05.6	136 20.4	120	19 17.7+ 73
9	9	85 11.1	321 41.2	.. 41.0	308 19.2	.. 43.0	311 54.1	.. 06.4	222 18.2	.. 05.6	150 51.4	121	19 10.4+ 75
10	10	100 13.6	336 40.4	40.4	323 20.1	42.5	326 56.1	06.3	237 20.7	05.6	165 22.5	121	19 02.9+ 75
11	11	115 16.0	351 39.6	39.8	338 20.9	42.0	341 58.0	06.1	252 23.1	05.6	179 53.6	121	18 55.4+ 77
12	12	130 18.5	6 38.9	+20 39.2	353 21.8	+17 41.6	356 59.9	+18 06.0	267 25.5	-14 05.7	194 24.7	122	-18 47.7+ 77
13	13	145 20.9	21 38.1	38.6	8 22.7	41.1	12 01.8	05.8	282 27.9	05.7	208 55.9	121	18 40.0+ 79
14	14	160 23.4	36 37.4	38.0	23 23.5	40.7	27 03.7	05.7	297 30.3	05.7	223 27.0	122	18 32.1+ 79
15	15	175 25.9	51 36.6	.. 37.4	38 24.4	.. 40.2	42 05.6	.. 05.5	312 32.7	.. 05.8	237 58.2	123	18 24.2+ 80
16	16	190 28.3	66 35.8	36.8	53 25.3	39.7	57 07.5	05.4	327 35.1	05.8	252 29.5	122	18 16.2+ 81
17	17	205 30.8	81 35.1	36.2	68 26.1	39.3	72 09.4	05.2	342 37.5	05.8	267 00.7	123	18 08.1+ 82
18	18	220 33.3	96 34.3	+20 35.6	83 27.0	+17 38.8	87 11.3	+18 05.1	357 39.9	-14 05.8	281 32.0	124	-17 59.9+ 82
19	19	235 35.7	111 33.6	35.0	98 27.9	38.3	102 13.2	04.9	12 42.4	05.9	296 03.4	123	17 51.7+ 84
20	20	250 38.2	126 32.8	34.4	113 28.7	37.9	117 15.1	04.8	27 44.8	05.9	310 34.7	124	17 43.3+ 85
21	21	265 40.7	141 32.0	.. 33.8	128 29.6	.. 37.4	132 17.0	.. 04.7	42 47.2	.. 05.9	325 06.1	124	17 34.8+ 85
22	22	280 43.1	156 31.3	33.2	143 30.5	36.9	147 18.9	04.5	57 49.6	06.0	339 37.5	124	17 26.3+ 86
23	23	295 45.6	171 30.5	32.6	158 31.3	36.5	162 20.8	04.4	72 52.0	06.0	354 08.9	125	17 17.7+ 87
3	0	310 48.1	186 29.8	+20 32.0	173 32.2	+17 36.0	177 22.7	+18 04.2	87 54.4	-14 06.0	8 40.4	125	-17 09.0+ 88
1	1	325 50.5	201 29.0	31.3	188 33.0	35.6	192 24.6	04.1	102 56.8	06.0	23 11.9	125	17 00.2+ 89
2	2	340 53.0	216 28.3	30.7	203 33.9	35.1	207 26.5	03.9	117 59.2	06.1	37 43.4	126	16 51.3+ 89
3	3	355 55.4	231 27.5	.. 30.1	218 34.8	.. 34.6	222 28.4	.. 03.8	133 01.6	.. 06.1	52 15.0	125	16 42.4+ 91
4	4	10 57.9	246 26.7	29.5	233 35.6	34.2	237 30.4	03.6	148 04.0	06.1	66 46.5	126	16 33.3+ 91
5	5	26 00.4	261 26.0	28.9	248 36.5	33.7	252 32.3	03.5	163 06.4	06.1	81 18.1	127	16 24.2+ 92
6	6	41 02.8	276 25.2	+20 28.3	263 37.4	+17 33.2	267 34.2	+18 03.3	178 08.8	-14 06.2	95 49.8	126	-16 15.0+ 93
7	7	56 05.3	291 24.5	27.7	278 38.2	32.8	282 36.1	03.2	193 11.3	06.2	110 21.4	127	16 05.7+ 93
8	8	71 07.8	306 23.7	27.0	293 39.1	32.3	297 38.0	03.0	208 13.7	06.2	124 53.1	127	15 56.4+ 94
9	9	86 10.2	321 23.0	.. 26.4	308 40.0	.. 31.8	312 39.9	.. 02.9	223 16.1	.. 06.3	139 24.8	128	15 47.0+ 96
10	10	101 12.7	336 22.2	25.8	323 40.8	31.4	327 41.8	02.7	238 18.5	06.3	153 56.6	128	15 37.4+ 96
11	11	116 15.2	351 21.5	25.2	338 41.7	30.9	342 43.7	02.6	253 20.9	06.3	168 28.4	128	15 27.8+ 96
12	12	131 17.6	6 20.7	+20 24.6	353 42.6	+17 30.4	357 45.6	+18 02.4	268 23.3	-14 06.3	183 00.2	128	-15 18.2+ 98
13	13	146 20.1	21 20.2	23.9	8 43.5	30.0	12 47.5	02.3	283 25.7	06.4	197 32.0	129	15 08.4+ 98
14	14	161 22.5	36 19.2	23.3	23 44.3	29.5	27 49.4	02.1	298 28.1	06.4	212 03.8	129	14 58.6+ 99
15	15	176 25.0	51 18.5	.. 22.7	38 45.2	.. 29.0	42 51.3	.. 02.0	313 30.5	.. 06.4	226 35.7	129	14 48.7+ 99
16	16	191 27.5	66 17.7	22.1	53 46.1	28.5	57 53.2	01.8	328 32.9	06.5	241 07.6	130	14 38.8+101
17	17	206 29.9	81 17.0	21.4	68 46.9	28.1	72 55.1	01.7	343 35.3	06.5	255 39.6	129	14 28.7+101
18	18	221 32.4	96 16.2	+20 20.8	83 47.8	+17 27.6	87 57.0	+18 01.5	358 37.7	-14 06.5	270 11.5	130	-14 18.6+102
19	19	236 34.9	111 15.5	20.2	98 48.7	27.1	102 58.9	01.4	13 40.1	06.5	284 43.5	130	14 08.4+102
20	20	251 37.3	126 14.7	19.5	113 49.5	26.7	118 00.8	01.3	28 42.5	06.6	299 15.5	130	13 58.2+103
21	21	266 39.8	141 14.0	.. 18.9	128 50.4	.. 26.2	133 02.8	.. 01.1	43 44.9	.. 06.6	313 47.5	131	13 47.9+104
22	22	281 42.3	156 13.2	18.3	143 51.3	25.7	148 04.7	01.0	58 47.4	06.6	328 19.6	131	13 37.5+105
23	23	296 44.7	171 12.5	17.7	158 52.1	25.3	163 06.6	00.8	73 49.8	06.7	342 51.7	131	13 27.0+105
4	0	311 47.2	186 11.7	+20 17.0	173 53.0	+17 24.8	178 08.5	+18 00.7	88 52.2	-14 06.7	357 23.8	131	-13 16.5+106
1	1	326 49.7	201 11.0	16.4	188 53.9	24.3	193 10.4	00.5	103 54.6	06.7	11 55.9	132	13 05.9+107
2	2	341 52.1	216 10.2	15.7	203 54.7	23.9	208 12.3	00.4	118 57.0	06.7	26 28.1	131	12 55.2+107
3	3	356 54.6	231 09.5	.. 15.1	218 55.6	.. 23.4	223 14.2	.. 00.2	133 59.4	.. 06.8	41 00.2	132	12 44.5+108
4	4	11 57.0	246 08.7	14.5	233 56.5	22.9	238 16.1	18 00.1	149 01.8	06.8	55 32.4	132	12 33.7+108
5	5	26 59.5	261 08.0	13.8	248 57.3	22.4	253 18.0	17 59.9	164 04.2	06.8	70 04.6	133	12 22.9+110
6	6	42 02.0	276 07.2	+20 13.2	263 58.2	+17 22.0	268 19.9	+17 59.8	179 06.6	-14 06.9	84 36.9	132	-12 11.9+109
7	7	57 04.4	291 06.5	12.6	278 59.1	21.5	283 21.8	59.6	194 09.0	06.9	99 09.1	133	12 01.0+111
8	8	72 06.9	306 05.8	11.9	294 00.0	21.0	298 23.7	59.5	209 11.4	06.9	113 41.4	133	11 49.9+111
9	9	87 09.4	321 05.0	.. 11.3	309 00.8	.. 20.6	313 25.6	.. 59.3	224 13.8	.. 07.0	128 13.7	133	11 38.8+111
10	10	102 11.8	336 04.3	10.6	324 01.7	20.1	328 27.5	59.2	239 16.2	07.0	142 46.0	134	11 27.7+113
11	11	117 14.3	351 03.5	10.0	339 02.6	19.6	343 29.4	59.0	254 18.6	07.0	157 18.4	133	11 16.4+112
12	12	132 16.8	6 02.8	+20 09.3	354 03.4	+17 19.1	358 31.3	+17 58.9	269 21.0	-14 07.0	171 50.7	134	-11 05.2+114
13	13	147 19.2	21 02.0	08.7	9 04.3	18.7	13 33.3	58.7	284 23.4	07.1	186 23.1	134	10 53.8+114
14	14	162 21.7	36 01.3	08.0	24 05.2	18.2	28 35.2	58.6	299 25.8	07.1	200 55.5	134	10 42.4+114
15	15	177 24.2	51 00.6	.. 07.4	39 06.1	.. 17.7	43 37.1	.. 58.4	314 28.2	.. 07.1	215 27.9	134	10 31.0+115
16	16	192 26.6	65 59.8	06.7	54 06.9	17.2	58 39.0	58.3	329 30.6	07.2	230 00.3	135	10 19.5+116
17	17	207 29.1	80 59.1	06.1	69 07.8	16.8	73 40.9	58.1	344 33.0	07.2	244 32.8	134	10 07.9+116
18	18	222 31.5	95 58.3	+20 05.4	84 08.7	+17 16.3	88 42.8	+17 58.0	359 35.4	-14 07.2	259 05.2	135	-9 56.3+116
19	19	237 34.0	110 57.6	04.8	99 09.5	15.8	103 44.7	57.8	14 37.8	07.2	273 37.7	135	9 44.7+117
20	20	252 36.5	125 56.9	04.1	114 10.4	15.4	118 46.6	57.7	29 40.2	07.3	288 10.2	135	9 33.0+118
21	21	267 38.9	140 56.1	.. 03.5	129 11.3	.. 14.9	133 48.5	.. 57.5	44 42.6	.. 07.3	302 42.7	135	9 21.2+118
22	22	282 41.4	155 55.4	02.8	144 12.2	14.4	148 50.4	57.4	59 45.0	07.3	317 15.2	135	9 09.4+119
23	23	297 43.9	170 54.7	02.2	159 13.0	13.9	163 52.3	57.2	74 47.4	07.4	331 47.7	136	8 57.5+119
24	24	312 46.3	185 53.9	+20 01.5	174 13.9	+17 13.5	178 54.2	+17 57.1	89 49.8	-14 07.4	346 20.3	135	-8 45.6+119
code		-	- 7	- 7	+ 9	- 4	+ 19	- 1	+ 24	- 1			

G M T	SUN			STARS			Lat.	Sunrise	Twilt. begins	Moonrise					ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.	No.	Name	SHA	Dec.									Sun's Low'r Limb	Venus	Mars			
										2	3	4	5	Add				Add	Add	
h	°	'	°		'	°	N	h	m	h	m	h	m	h	m	Alt.	°	'	°	'
2	0	178 26.4	+18 01.6	7	Acamar	315 51.2	-40 28.6	72	1	37	22 25	21 23	20 53	20 30	30	0	0.1	0.1	0.1	
1	193 26.4	00.9		5	Achernar	335 58.7	-57 27.3	70	1	37	21 24	20 56	20 38	20 24	45	0	0.1	0.1	0.0	
2	208 26.5	18 00.3		30	Acruz	173 58.3	-62 51.5	68	2	21	20 48	20 36	20 27	20 19	60	0	0.1	0.1	0.0	
3	223 26.5	-17 59.7		19	Adhara	255 46.9	-28 54.5	66	2	50	20 23	20 20	20 17	20 14	75	0	0.1	0.0	0.0	
4	238 26.5	59.0		10	Aldebaran	291 39.3	+16 25.3	64	3	12	20 03	20 07	20 09	20 11	90	0	0.1	0.0	0.0	
5	253 26.6	58.4						62	3	29	19 47	19 56	20 02	20 07						
6	268 26.6	+17 57.8		32	Alioth	166 58.8	+56 12.2	60	3	43	19 33	19 46	19 56	20 04						
7	283 26.7	57.1		34	Alkaid	153 33.0	+49 32.3	58	3	55	19 21	19 38	19 51	20 02						
8	298 26.7	56.5		55	Al Na'ir	28 37.6	-47 10.4	56	4	06	19 11	19 30	19 46	20 00						
9	313 26.7	55.9		15	Alnilam	276 30.6	-1 13.6	54	4	15	19 02	19 23	19 41	19 58						
10	328 26.8	55.2		25	Alphard	218 39.0	-8 27.9	52	4	23	18 54	19 17	19 37	19 56						
11	343 26.8	54.6						50	4	31	18 47	19 12	19 34	19 54						
12	358 26.9	+17 54.0		41	Alphecca	126 47.6	+26 52.0	45	4	46	18 31	19 00	19 26	19 50						
13	13 26.9	53.3		1	Alpheratz	358 28.2	+28 50.8	40	4	59	18 18	18 50	19 20	19 47						
14	28 26.9	52.7		51	Altair	62 50.2	+8 45.2	35	5	10	18 07	18 42	19 14	19 45						
15	43 27.0	52.1		2	Ankaa	353 58.1	-42 32.4	30	5	20	17 58	18 35	19 09	19 42						
16	58 27.0	51.4		42	Antares	113 19.3	-26 20.2	20	5	36	17 41	18 22	19 00	19 38						
17	73 27.1	50.8						10	5	50	17 26	18 10	18 53	19 34						
18	88 27.1	+17 50.2		37	Arcturus	146 35.3	+19 24.9	0	6	03	17 13	18 00	18 46	19 31						
19	103 27.2	49.5		43	Atria	108 59.8	-68 57.2	10	6	16	16 59	17 49	18 38	19 27						
20	118 27.2	48.9		22	Avior	234 36.5	-59 22.0	20	6	29	16 45	17 38	18 31	19 24						
21	133 27.2	48.2		13	Bellatrix	279 18.7	+6 18.7	30	6	45	16 28	17 25	18 22	19 19						
22	148 27.3	47.6		16	Betelge'se	271 48.5	+7 24.1	35	6	53	16 18	17 17	18 17	19 17						
23	163 27.3	47.0						40	7	04	16 07	17 08	18 11	19 14						
				17	Canopus	264 15.9	-52 40.1	45	7	15	15 53	16 58	18 04	19 11						
				12	Capella	281 38.8	+45 57.2	50	7	30	15 37	16 46	17 56	19 07						
				53	Deneb	50 00.6	+45 07.4	52	7	36	15 29	16 40	17 52	19 05						
				28	Denebola	183 18.0	+14 49.3	54	7	44	15 21	16 34	17 48	19 04						
				4	Diphda	349 39.2	-18 13.5	56	7	52	15 43	16 27	17 43	19 01						
								58	8	01	15 00	16 19	17 38	18 59						
				27	Dubhe	194 45.2	+61 59.6	60	8	12	14 48	16 09	17 32	18 56						
				14	El Nath	279 07.7	+28 34.3													
				47	Eltanin	91 05.9	+51 29.8													
				54	Enif	34 29.4	+9 40.4													
				56	Fomalhaut	16 11.4	-29 51.2													
				31	Gacrux	172 49.7	-56 52.2													
				29	Gienah	176 37.1	-17 17.8													
				35	Hadar	149 49.6	-60 09.9													
				6	Hamal	328 49.7	+23 15.2													
				48	Kaus Aust.	84 40.9	-34 24.5													
				40	Kochab	137 17.8	+74 20.5													
				57	Markab	14 21.3	+14 58.1													
				8	Menkar	315 00.4	+3 55.1													
				36	Menkent	148 58.8	-36 09.4													
				24	Miapl'dus	221 50.0	-69 32.2													
				9	Mirfak	309 42.6	+49 42.2													
				50	Nunki	76 51.7	-26 21.2													
				52	Peacock	54 26.8	-56 52.6													
				21	Pollux	244 21.0	+28 08.1													
				20	Procyon	245 45.4	+5 20.4													
				46	R'alhague	96 46.4	+12 35.6													
				26	Regulus	208 29.9	+12 11.1													
				11	Rigel	281 53.9	-8 15.0													
				38	Rigel Kent.	140 51.1	-60 39.6													
				44	Sabik	103 02.1	-15 40.3													
				3	Schedar	350 29.8	+56 17.6													
				45	Shaula	97 20.5	-37 04.5													
				18	Sirius	259 12.2	-16 39.1													
				33	Spica	159 17.1	-10 55.9													
				23	Suhail	223 24.8	-43 15.2													
				49	Vega	81 07.9	+38 44.7													
				39	Zub'g'bi	137 53.4	-15 51.6													
																		</		

G M T	T GHA	VENUS - 3.4		MARS 2.0		JUPITER - 1.3		SATURN 0.8		MOON			
		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
5	h	o	'	o	'	o	'	o	'	o	'	o	'
0	1	312 46.3	185 53.9	+20 01.5	174 13.9	+17 13.5	178 54.2	+17 57.1	89 49.8	-14 07.4	346 20.3	135 -	8 45.6 +119
1	2	327 48.8	200 53.2	00.8	189 14.8	13.0	193 56.1	56.9	104 52.2	07.4	0 52.8	136	8 33.7 +120
2	3	342 51.3	215 52.4	20 00.2	204 15.6	12.5	208 58.0	56.8	119 54.6	07.5	15 25.4	136	8 21.7 +121
3	4	357 53.7	230 51.7	-19 59.5	219 16.5	12.0	223 59.9	56.7	134 57.0	07.5	29 58.0	135	8 09.6 +121
4	5	12 56.2	245 51.0	58.9	234 17.4	11.6	239 01.8	56.5	149 59.4	07.5	44 30.5	136	7 57.5 +121
5	6	27 58.6	260 50.2	58.2	249 18.3	11.1	254 03.8	56.4	165 01.8	07.5	59 03.1	136	7 45.4 +122
6	7	43 01.1	275 49.5	+19 57.5	264 19.1	+17 10.6	269 05.7	+17 56.2	180 04.2	-14 07.6	73 35.7	136 -	7 33.2 +122
7	8	58 03.6	290 48.8	56.9	279 20.0	10.1	284 07.6	56.1	195 06.6	07.6	88 08.3	137	7 21.0 +122
8	9	73 06.0	305 48.0	56.2	294 20.9	09.7	299 09.5	55.9	210 09.0	07.6	102 41.0	136	7 08.8 +123
9	10	88 08.5	320 47.3	55.5	309 21.8	09.2	314 11.4	55.8	225 11.4	07.7	117 13.6	136	6 56.5 +124
10	11	103 11.0	335 46.6	54.9	324 22.6	08.7	329 13.3	55.6	240 13.8	07.7	131 46.2	136	6 44.1 +123
11	12	118 13.4	350 45.8	54.2	339 23.5	08.2	344 15.2	55.5	255 16.2	07.7	146 18.8	137	6 31.8 +125
12	13	133 15.9	5 45.1	+19 53.5	354 24.4	+17 07.7	359 17.1	+17 55.3	270 18.6	-14 07.8	160 51.5	136 -	6 19.3 +124
13	14	148 18.4	20 44.4	52.8	9 25.3	07.3	14 19.0	55.2	285 21.0	07.8	175 24.1	137	6 06.9 +125
14	15	163 20.8	35 43.6	52.2	24 26.1	06.8	29 20.9	55.0	300 23.4	07.8	189 56.8	136	5 54.4 +125
15	16	178 23.3	50 42.9	51.5	39 27.0	06.3	44 22.8	54.9	315 25.8	07.9	204 29.4	137	5 41.9 +126
16	17	193 25.8	65 42.2	50.8	54 27.9	05.8	59 24.7	54.7	330 28.2	07.9	219 02.1	136	5 29.3 +125
17	18	208 28.2	80 41.4	50.1	69 28.8	05.4	74 26.6	54.6	345 30.6	07.9	233 34.7	137	5 16.8 +127
18	19	223 30.7	95 40.7	+19 49.5	84 29.6	+17 04.9	89 28.5	+17 54.4	0 33.0	-14 07.9	248 07.4	136 -	5 04.1 +126
19	20	238 33.1	110 40.0	48.8	99 30.5	04.4	104 30.4	54.3	15 35.4	08.0	262 40.0	136	4 51.5 +127
20	21	253 35.6	125 39.3	48.1	114 31.4	03.9	119 32.3	54.1	30 37.8	08.0	277 12.6	137	4 38.8 +127
21	22	268 38.1	140 38.5	47.4	129 32.3	03.4	134 34.3	54.0	45 40.2	08.0	291 45.3	136	4 26.1 +127
22	23	283 40.5	155 37.8	46.8	144 33.1	03.0	149 36.2	53.8	60 42.6	08.1	306 17.9	137	4 13.4 +128
23		298 43.0	170 37.1	46.1	159 34.0	02.5	164 38.1	53.7	75 45.0	08.1	320 50.6	136	4 00.6 +128
6	0	313 45.5	185 36.3	+19 45.4	174 34.9	+17 02.0	179 40.0	+17 53.5	90 47.4	-14 08.1	335 23.2	136 -	3 47.8 +128
1	1	328 47.9	200 35.6	44.7	189 35.8	01.5	194 41.9	53.4	105 49.8	08.2	349 55.8	136	3 35.0 +128
2	2	343 50.4	215 34.9	44.0	204 36.6	01.0	209 43.8	53.2	120 52.2	08.2	4 28.4	137	3 22.2 +129
3	3	358 52.9	230 34.2	43.3	219 37.5	00.6	224 45.7	53.1	135 54.6	08.2	19 01.1	136	3 09.3 +129
4	4	13 55.3	245 33.4	42.7	234 38.4	17 00.1	239 47.6	52.9	150 57.0	08.3	33 33.7	136	2 56.4 +129
5	5	28 57.8	260 32.7	42.0	249 39.3	16 59.6	254 49.5	52.8	165 59.4	08.3	48 06.3	135	2 43.5 +129
6	6	44 00.2	275 32.0	+19 41.3	264 40.1	+16 59.1	269 51.4	+17 52.6	181 01.8	-14 08.3	62 38.8	136 -	2 30.6 +130
7	7	59 02.7	290 31.3	40.6	279 41.0	58.6	284 53.3	52.5	196 04.2	08.3	77 11.4	136	2 17.6 +129
8	8	74 05.2	305 30.5	39.9	294 41.9	58.2	299 55.2	52.3	211 06.6	08.4	91 44.0	135	2 04.7 +130
9	9	89 07.6	320 29.8	39.2	309 42.8	57.7	314 57.1	52.2	226 09.0	08.4	106 16.5	136	1 51.7 +130
10	10	104 10.1	335 29.1	38.5	324 43.7	57.2	329 59.0	52.0	241 11.4	08.4	120 49.1	135	1 38.7 +130
11	11	119 12.6	350 28.4	37.8	339 44.5	56.7	345 01.0	51.9	256 13.8	08.5	135 21.6	135	1 25.7 +131
12	12	134 15.0	5 27.6	+19 37.1	354 45.4	+16 56.2	0 02.9	+17 51.7	271 16.2	-14 08.5	149 54.1	135 -	1 12.6 +130
13	13	149 17.5	20 26.9	36.4	9 46.3	55.8	15 04.8	51.6	286 18.6	08.5	164 26.6	135	0 59.6 +131
14	14	164 20.0	35 26.2	35.7	24 47.2	55.3	30 06.7	51.4	301 20.9	08.6	178 59.1	135	0 46.5 +130
15	15	179 22.4	50 25.5	35.0	39 48.0	54.8	45 08.6	51.3	316 23.3	08.6	193 31.6	134	0 33.5 +131
16	16	194 24.9	65 24.8	34.3	54 48.9	54.3	60 10.5	51.1	331 25.7	08.6	208 04.0	135	0 20.4 +131
17	17	209 27.4	80 24.0	33.6	69 49.8	53.8	75 12.4	51.0	346 28.1	08.7	222 36.5	134 -	0 07.3 +131
18	18	224 29.8	95 23.3	+19 32.9	84 50.7	+16 53.3	90 14.3	+17 50.8	1 30.5	-14 08.7	237 08.9	134 +	0 05.8 +131
19	19	239 32.3	110 22.6	32.2	99 51.6	52.9	105 16.2	50.7	16 32.9	08.7	251 41.3	133	0 18.9 +131
20	20	254 34.7	125 21.9	31.5	114 52.4	52.4	120 18.1	50.5	31 35.3	08.8	266 13.6	134	0 32.0 +132
21	21	269 37.2	140 21.2	30.8	129 53.3	51.9	135 20.0	50.4	46 37.7	08.8	280 46.0	133	0 45.2 +131
22	22	284 39.7	155 20.4	30.1	144 54.2	51.4	150 21.9	50.2	61 40.1	08.8	295 18.3	133	0 58.3 +131
23	23	299 42.1	170 19.7	29.4	159 55.1	50.9	165 23.8	50.1	76 42.5	08.9	309 50.6	133	1 11.4 +131
7	0	314 44.6	185 19.0	+19 28.7	174 55.9	+16 50.4	180 25.7	+17 49.9	91 44.9	-14 08.9	324 22.9	132 +	1 24.5 +132
1	1	329 47.1	200 18.3	28.0	189 56.8	50.0	195 27.6	49.8	106 47.3	08.9	338 55.1	133	1 37.7 +131
2	2	344 49.5	215 17.6	27.3	204 57.7	49.5	210 29.6	49.6	121 49.7	09.0	353 27.4	131	1 50.8 +132
3	3	359 52.0	230 16.9	26.6	219 58.6	49.0	225 31.5	49.5	136 52.1	09.0	7 59.5	132	2 04.0 +131
4	4	14 54.5	245 16.1	25.9	234 59.5	48.5	240 33.4	49.3	151 54.5	09.0	22 31.7	132	2 17.1 +131
5	5	29 56.9	260 15.4	25.2	250 00.3	48.0	255 35.3	49.2	166 56.8	09.1	37 03.9	131	2 30.2 +131
6	6	44 59.4	275 14.7	+19 24.5	265 01.2	+16 47.5	270 37.2	+17 49.0	181 59.2	-14 09.1	51 36.0	130 +	2 43.3 +132
7	7	60 01.9	290 14.0	23.8	280 02.1	47.0	285 39.1	48.9	197 01.6	09.1	66 08.0	131	2 56.5 +131
8	8	75 04.3	305 13.3	23.0	295 03.0	46.6	300 41.0	48.7	212 04.0	09.1	80 40.1	130	3 09.6 +131
9	9	90 06.8	320 12.6	22.3	310 03.9	46.1	315 42.9	48.6	227 06.4	09.2	95 12.1	130	3 22.7 +131
10	10	105 09.2	335 11.9	21.6	325 04.7	45.6	330 44.8	48.4	242 08.8	09.2	109 44.1	129	3 35.8 +131
11	11	120 11.7	350 11.2	20.9	340 05.6	45.1	345 46.7	48.3	257 11.2	09.2	124 16.0	129	3 48.9 +131
12	12	135 14.2	5 10.4	+19 20.2	355 06.5	+16 44.6	0 48.6	+17 48.1	272 13.6	-14 09.3	138 47.9	129 +	4 02.0 +131
13	13	150 16.6	20 09.7	19.5	10 07.4	44.1	15 50.5	48.0	287 16.0	09.3	153 19.8	128	4 15.1 +130
14	14	165 19.1	35 09.0	18.7	25 08.3	43.6	30 52.4	47.8	302 18.4	09.3	167 51.6	128	4 28.1 +131
15	15	180 21.6	50 08.3	18.0	40 09.2	43.2	45 54.4	47.7	317 20.8	09.4	182 23.4	128	4 41.2 +130
16	16	195 24.0	65 07.6	17.3	55 10.0	42.7	60 56.3	47.5	332 23.2	09.4	196 55.2	127	4 54.2 +130
17	17	210 26.5	80 06.9	16.6	70 10.9	42.2	75 58.2	47.4	347 25.5	09.4	211 26.9	127	5 07.2 +130
18	18	225 29.0	95 06.2	+19 15.9	85 11.8	+16 41.7	91 00.1	+17 47.2	2 27.9	-14 09.5	225 58.6	126 +	5 20.2 +130
19	19	240 31.4	110 05.5	15.1	100 12.7	41.2	106 02.0	47.1	17 30.3	09.5	240 30.2	126	5 33.2 +130
20	20	255 33.9	125 04.8	14.4	115 13.6	40.7	121 03.9	46.9	32 32.7	09.5	255 01.8	126	5 46.2 +129
21	21	270 36.3	140 04.1	13.7	130 14.4	40.2	136 05.8	46.8	47 35.1	09.6	269 33.4	125	5 59.1 +130
22	22	285 38.8	155 03.3	13.0	145 15.3	39.7	151 07.7	46.6	62 37.5	09.6	284 04.9	124	6 12.1 +129
23	23	300 41.3	170 02.6	12.2	160 16.2	39.3	166 09.6	46.5	77 39.9	09.6	298 36.3	124	6 25.0 +129
24		315 43.7	185 01.9	+19 11.5	175 17.1	+16 38.8	181 11.5	+17 46.3	92 42.3	-14 09.7	313 07.7	124 +	6 37.9 +128
code		-	- 7	- 7	+ 9	- 4	+ 19	- 1	+ 24	0			

G M T	SUN		STARS		Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.	No.	Name SHA Dec.				5	6	7	8	Alt.	Sun's Low'r Limb	Venus	Mars		
h	°	'	°	'	N	h m	h m	h m	h m	h m	h m	h m	h m	°	'	'	'
5	0	178 29.8	+17 15.0	7 Acamar	315 51.2	-40 28.5	72	0 41	///	20 30	20 10	19 49	19 25	Alt.			
1	193 29.9	14.3	5 Achernar	335 58.7	-57 27.3	70	1 59	///	20 24	20 10	19 57	19 42					
2	208 29.9	13.7	30 Alkaid	173 58.3	-62 51.5	68	2 36	///	20 19	20 11	20 03	19 55					
3	223 30.0	13.0	19 Adhara	255 46.9	-28 54.5	66	3 01	///	20 14	20 11	20 09	20 06					
4	238 30.0	12.3	10 Aldebaran	291 39.3	+16 25.3	64	3 21	///	20 11	20 12	20 13	20 16					
5	253 30.1	11.7				62	3 37	///	20 07	20 12	20 17	20 23					
6	268 30.2	+17 11.0	32 Alioth	166 58.9	+56 12.2	60	3 51	///	20 04	20 12	20 21	20 30					
7	283 30.2	10.3	34 Alkaid	153 33.1	+49 32.3	58	4 02	///	20 02	20 13	20 24	20 37					
8	298 30.3	09.6	55 Al Na'ir	28 37.6	-47 10.4	56	4 12	///	20 00	20 13	20 27	20 42					
9	313 30.3	09.0	15 Alnilam	276 30.6	-1 13.6	54	4 20	1 01	19 58	20 13	20 29	20 47					
10	328 30.4	08.3	25 Alphard	218 39.0	-8 27.9	52	4 28	1 40	19 56	20 13	20 32	20 51					
11	343 30.5	07.6				50	4 35	2 05	19 54	20 13	20 34	20 55					
12	358 30.5	+17 07.0	41 Alphecca	126 47.6	+26 52.0	45	4 50	2 47	19 50	20 14	20 38	21 04					
13	13 30.6	06.3	1 Alpheratz	358 28.2	+28 50.8	40	5 02	3 14	19 47	20 14	20 42	21 12					
14	28 30.6	05.6	51 Altair	62 50.2	+8 45.2	35	5 12	3 36	19 45	20 14	20 45	21 18					
15	43 30.7	05.0	2 Ankaa	353 58.1	-42 32.4	30	5 21	3 52	19 42	20 15	20 48	21 24					
16	58 30.8	04.3	42 Antares	113 19.3	-26 20.2	20	5 37	4 17	19 38	20 15	20 53	21 34					
17	73 30.8	03.6				10	5 50	4 36	19 34	20 16	20 58	21 42					
18	88 30.9	+17 02.9	37 Arcturus	146 35.3	+19 24.9	0	6 02	4 51	19 31	20 16	21 02	21 51					
19	103 30.9	02.3	43 Atria	108 59.8	-68 57.2	10	6 15	5 02	19 27	20 17	21 07	21 59					
20	118 31.0	01.6	22 Avior	234 36.5	-59 22.0	20	6 28	5 12	19 24	20 17	21 12	22 08					
21	133 31.1	00.9	13 Bellatrix	279 18.7	+6 18.7	30	6 42	5 21	19 19	20 18	21 17	22 18					
22	148 31.1	17 00.2	16 Betelg'se	271 48.5	+7 24.1	35	6 51	5 25	19 17	20 18	21 20	22 24					
23	163 31.2	16 59.6				40	7 00	5 28	19 14	20 18	21 24	22 31					
			17 Canopus	264 15.8	-52 40.1	45	7 11	5 32	19 11	20 19	21 28	22 39					
6	0	178 31.3	+16 58.9	12 Capella	281 38.8	+45 57.2	50	7 25	5 34	19 07	20 19	21 33	22 48				
1	193 31.3	58.2	53 Deneb	50 00.6	+45 07.4	52	7 31	5 36	19 05	20 20	21 35	22 53					
2	208 31.4	57.5	28 Denebola	183 18.0	+14 49.3	54	7 38	5 37	19 04	20 20	21 38	22 58					
3	223 31.4	56.9	4 Diphda	349 39.1	-18 13.5	56	7 46	5 38	19 01	20 20	21 41	23 03					
4	238 31.5	56.2				58	7 54	5 39	18 59	20 21	21 44	23 09					
5	253 31.6	55.5	27 Dubhe	194 45.2	+61 59.6	60	8 04	5 40	18 56	20 21	21 48	23 16					
6	268 31.6	+16 54.8	14 Elnath	279 07.7	+28 34.3	S											
7	283 31.7	54.1	47 Eltanin	91 05.9	+51 29.9												
8	298 31.8	53.5	54 Enif	34 29.3	+9 40.4												
9	313 31.8	52.8	56 Fomalhaut	16 11.4	-29 51.2												
10	328 31.9	52.1				N	h m	h m	h m	h m	h m	h m	h m				
11	343 32.0	51.4	31 Gacrux	172 49.7	-56 52.2	72	23 12	///	5 25	7 23	9 21	11 25					
12	358 32.0	+16 50.7	29 Gienah	176 37.1	-17 17.8	70	22 07	///	5 37	7 26	9 16	11 10					
13	13 32.1	50.1	35 Hadar	149 49.7	-60 09.9	68	21 32	///	5 47	7 29	9 12	10 59					
14	28 32.2	49.4	6 Hamal	328 49.7	+23 15.3	66	21 07	///	5 55	7 31	9 09	10 50					
15	43 32.2	48.7	48 Kaus Aust.	84 40.9	-34 24.5	64	20 48	///	6 01	7 33	9 06	10 42					
16	58 32.3	48.0				62	20 33	///	6 07	7 35	9 04	10 35					
17	73 32.4	47.3	40 Kochab	137 17.9	+74 20.5	60	20 20	///	6 12	7 36	9 02	10 29					
18	88 32.4	+16 46.6	57 Markab	14 21.2	+14 58.1	58	20 08	///	6 16	7 38	9 00	10 24					
19	103 32.5	46.0	8 Menkar	315 00.4	+3 55.1	56	19 59	///	6 20	7 39	8 58	10 20					
20	118 32.6	45.3	36 Menkent	148 58.8	-36 09.4	54	19 50	23 02	6 24	7 40	8 57	10 16					
21	133 32.6	44.6	24 Miapl'dus	221 50.0	-69 32.1	52	19 43	22 27	6 27	7 41	8 55	10 12					
22	148 32.7	43.9				50	19 36	22 03	6 30	7 42	8 54	10 09					
23	163 32.8	43.2	9 Mirfak	309 42.6	+49 42.2	45	19 21	21 23	6 36	7 43	8 52	10 02					
			50 Nunki	76 51.7	-26 21.2	40	19 09	20 55	6 41	7 45	8 49	9 56					
7	0	178 32.8	+16 42.5	52 Peacock	54 26.8	-56 52.7	35	18 59	20 35	6 46	7 46	8 47	9 50				
1	193 32.9	41.8	21 Pollux	244 21.0	+28 08.1	30	18 50	20 18	6 49	7 47	8 46	9 46					
2	208 33.0	41.1	20 Procyon	245 45.4	+5 20.4	20	18 35	19 54	6 56	7 49	8 43	9 38					
3	223 33.1	40.5				10	18 22	19 36	7 02	7 51	8 40	9 31					
4	238 33.1	39.8	46 R'alhague	96 46.5	+12 35.6	0	18 09	19 21	7 07	7 52	8 38	9 25					
5	253 33.2	39.1	26 Regulus	208 29.9	+12 11.1	10	17 57	19 09	7 13	7 54	8 36	9 19					
6	268 33.3	+16 38.4	11 Rigel	281 53.9	-8 15.0	20	17 45	19 01	7 18	7 55	8 33	9 12					
7	283 33.3	37.7	38 Rigel Kent.	140 51.1	-60 39.6	30	17 30	18 52	7 25	7 57	8 30	9 04					
8	298 33.4	37.0	44 Sabik	103 02.1	-15 40.3	35	17 22	18 49	7 28	7 58	8 28	9 00					
9	313 33.5	36.3				40	17 12	18 45	7 32	7 59	8 27	8 55					
10	328 33.6	35.6	3 Schedar	350 29.8	+56 17.6	45	17 01	18 42	7 37	8 01	8 24	8 49					
11	343 33.6	34.9	45 Shaula	97 20.5	-37 04.5	50	16 48	18 39	7 43	8 02	8 22	8 42					
12	358 33.7	+16 34.2	18 Sirius	259 12.2	-16 39.1	52	16 42	18 39	7 45	8 03	8 21	8 39					
13	13 33.8	33.5	33 Spica	159 17.1	-10 55.9	54	16 35	18 38	7 48	8 04	8 19	8 36					
14	28 33.8	32.9	23 Suhail	223 24.8	-43 15.2	56	16 27	18 36	7 51	8 05	8 18	8 32					
15	43 33.9	32.2				58	16 18	18 35	7 55	8 05	8 16	8 28					
16	58 34.0	31.5	49 Vega	81 08.0	+38 44.7	60	16 09	18 35	7 58	8 07	8 14	8 23					
17	73 34.1	30.8	39 Zub'g'bi	137 53.4	-15 51.6	S											
18	88 34.1	+16 30.1															
19	103 34.2	29.4	G M T	Equation of Time (App.—Mean)			GMT of Transit Meridian of Greenwich										
20	118 34.3	28.7		5	6	7	DAY	Moon	Venus	Mars	Jupiter	Saturn					
21	133 34.4	28.0	h	m	s	m	s	h	m	h	m	h	m	h	m		
22	148 34.4	27.3	0	- 6 00.9	- 5 55.1	- 5 48.8	5	0 56	11 37	12 22	12 03	17 58					
23	163 34.5	26.6	6	- 5 59.5	- 5 53.6	- 5 47.1	6	1 42	11 38	12 21	12 00	17 54					
			12	- 5 58.1	- 5 52.0	- 5 45.4	7	2 27	11 39	12 20	11 57	17 50					
24	178 34.6	+16 25.9	18	- 5 56.6	- 5 50.4	- 5 43.6	8	3 14	11 40	12 18	11 54	17 46					
			24	- 5 55.1	- 5 48.8	- 5 41.8											
code	-	- 6											Subtract from table, back cover				

G M T	VENUS - 3.4		MARS 2.0		JUPITER - 1.3		SATURN 0.8		MOON				
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code	
8	h	°	°	°	°	°	°	°	°	°	°	°	
0	315 43.7	185 01.9	+19 11.5	175 17.1	+16 38.8	181 11.5	+17 46.3	92 42.3	-14 09.7	313 07.7	124 +	6 37.9 +128	
1	330 46.2	200 01.2	10.8	190 18.0	38.3	196 13.4	46.2	107 44.7	09.7	327 39.1	123	6 50.7 +129	
2	345 48.7	215 00.5	10.0	205 18.9	37.8	211 15.3	46.0	122 47.1	09.7	342 10.4	123	7 03.6 +128	
3	0 51.1	229 59.8	.. 09.3	220 19.7	.. 37.3	226 17.2	.. 45.9	137 49.4	.. 09.8	356 41.7	122	7 16.4 +127	
4	15 53.6	244 59.1	08.6	235 20.6	36.8	241 19.2	45.7	152 51.8	09.8	11 12.9	122	7 29.1 +128	
5	30 56.1	259 58.4	07.8	250 21.5	36.3	256 21.1	45.6	167 54.2	09.8	25 44.1	121	7 41.9 +127	
6	45 58.5	274 57.7	+19 07.1	265 22.4	+16 35.8	271 23.0	+17 45.4	182 56.6	-14 09.9	40 15.2	121 +	7 54.6 +127	
7	61 01.0	289 57.0	06.4	280 23.3	35.3	286 24.9	45.3	197 59.0	09.9	54 46.3	120	8 07.3 +127	
8	76 03.5	304 56.3	05.6	295 24.2	34.9	301 26.8	45.1	213 01.4	09.9	69 17.3	119	8 20.0 +126	
9	91 05.9	319 55.6	.. 04.9	310 25.0	.. 34.4	316 28.7	.. 45.0	228 03.8	.. 10.0	83 48.2	119	8 32.6 +126	
10	106 08.4	334 54.9	04.2	325 25.9	33.9	331 30.6	44.8	243 06.2	10.0	98 19.1	119	8 45.2 +125	
11	121 10.8	349 54.2	03.4	340 26.8	33.4	346 32.5	44.7	258 08.5	10.0	112 50.0	117	8 57.7 +126	
12	136 13.3	4 53.5	+19 02.7	355 27.7	+16 32.9	1 34.4	+17 44.5	273 10.9	-14 10.1	127 20.7	118 +	9 10.3 +124	
13	151 15.8	19 52.8	01.9	10 28.6	32.4	16 36.3	44.4	288 13.3	10.1	141 51.5	116	9 22.7 +125	
14	166 18.2	34 52.1	01.2	25 29.5	31.9	31 38.2	44.2	303 15.7	10.1	156 22.1	116	9 35.2 +124	
15	181 20.7	49 51.4	.. 19 00.5	40 30.3	.. 31.4	46 40.1	.. 44.1	318 18.1	.. 10.2	170 52.7	116	9 47.6 +123	
16	196 23.2	64 50.7	18 59.7	55 31.2	30.9	61 42.0	43.9	333 20.5	10.2	185 23.3	115	9 59.9 +124	
17	211 25.6	79 50.0	59.0	70 32.1	30.4	76 44.0	43.8	348 22.9	10.3	199 53.8	114	10 12.3 +122	
18	226 28.1	94 49.3	+18 58.2	85 33.0	+16 29.9	91 45.9	+17 43.6	3 25.3	-14 10.3	214 24.2	114	+10 24.5 +123	
19	241 30.6	109 48.6	57.5	100 33.9	29.4	106 47.8	43.5	18 27.6	10.3	228 54.6	113	10 36.8 +121	
20	256 33.0	124 47.9	56.7	115 34.8	29.0	121 49.7	43.3	33 30.0	10.4	243 24.9	112	10 48.9 +122	
21	271 35.5	139 47.2	.. 56.0	130 35.7	.. 28.5	136 51.6	.. 43.2	48 32.4	.. 10.4	257 55.1	112	.. 11 01.1 +121	
22	286 37.9	154 46.5	55.2	145 36.5	28.0	151 53.5	43.0	63 34.8	10.4	272 25.3	111	11 13.2 +120	
23	301 40.4	169 45.8	54.5	160 37.4	27.5	166 55.4	42.9	78 37.2	10.5	286 55.4	110	11 25.2 +120	
9	0	316 42.9	184 45.1	+18 53.7	175 38.3	+16 27.0	181 57.3	+17 42.7	93 39.6	-14 10.5	301 25.4	110	+11 37.2 +119
1	331 45.3	199 44.4	53.0	190 39.2	26.5	196 59.2	42.6	108 42.0	10.5	315 55.4	109	11 49.1 +119	
2	346 47.8	214 43.7	52.2	205 40.1	26.0	212 01.1	42.4	123 44.3	10.6	330 25.3	108	12 01.0 +118	
3	1 50.3	229 43.0	.. 51.5	220 41.0	.. 25.5	227 03.0	.. 42.3	138 46.7	.. 10.6	344 55.1	108	.. 12 12.8 +118	
4	16 52.7	244 42.3	50.7	235 41.9	25.0	242 04.9	42.1	153 49.1	10.6	359 24.9	107	12 24.6 +117	
5	31 55.2	259 41.6	50.0	250 42.7	24.5	257 06.9	42.0	168 51.5	10.7	13 54.6	106	12 36.3 +116	
6	46 57.7	274 40.9	+18 49.2	265 43.6	+16 24.0	272 08.8	+17 41.8	183 53.9	-14 10.7	28 24.2	106	+12 47.9 +116	
7	62 00.1	289 40.2	48.4	280 44.5	23.5	287 10.7	41.7	198 56.3	10.7	42 53.8	104	12 59.5 +115	
8	77 02.6	304 39.6	47.7	295 45.4	23.0	302 12.6	41.5	213 58.6	10.8	57 23.2	104	13 11.0 +115	
9	92 05.1	319 38.9	.. 46.9	310 46.3	.. 22.5	317 14.5	.. 41.4	229 01.0	.. 10.8	71 52.6	104	.. 13 22.5 +114	
10	107 07.5	334 38.2	46.2	325 47.2	22.0	332 16.4	41.2	244 03.4	10.8	86 22.0	102	13 33.9 +113	
11	122 10.0	349 37.5	45.4	340 48.1	21.5	347 18.3	41.1	259 05.8	10.9	100 51.2	102	13 45.2 +113	
12	137 12.4	4 36.8	+18 44.6	355 49.0	+16 21.1	2 20.2	+17 40.9	274 08.2	-14 10.9	115 20.4	101	+13 56.5 +111	
13	152 14.9	19 36.1	43.9	10 49.8	20.6	17 22.1	40.8	289 10.6	10.9	129 49.5	100	14 07.6 +112	
14	167 17.4	34 35.4	43.1	25 50.7	20.1	32 24.0	40.6	304 13.0	11.0	144 18.5	100	14 18.8 +110	
15	182 19.8	49 34.7	.. 42.3	40 51.6	.. 19.6	47 25.9	.. 40.4	319 15.3	.. 11.0	158 47.5	99	.. 14 29.8 +110	
16	197 22.3	64 34.0	41.6	55 52.5	19.1	62 27.9	40.3	334 17.7	11.0	173 16.4	98	14 40.8 +109	
17	212 24.8	79 33.3	40.8	70 53.4	18.6	77 29.8	40.1	349 20.1	11.1	187 45.2	97	14 51.7 +108	
18	227 27.2	94 32.7	+18 40.0	85 54.3	+16 18.1	92 31.7	+17 40.0	4 22.5	-14 11.1	202 13.9	96	+15 02.5 +108	
19	242 29.7	109 32.0	39.3	100 55.2	17.6	107 33.6	39.8	19 24.9	11.2	216 42.5	96	.. 15 13.3 +107	
20	257 32.2	124 31.3	38.5	115 56.1	17.1	122 35.5	39.7	34 27.2	11.2	231 11.1	95	15 24.0 +106	
21	272 34.6	139 30.6	.. 37.7	130 56.9	.. 16.6	137 37.4	.. 39.5	49 29.6	.. 11.2	245 39.6	94	.. 15 34.6 +105	
22	287 37.1	154 29.9	37.0	145 57.8	16.1	152 39.3	39.4	64 32.0	11.3	260 08.0	93	15 45.1 +104	
23	302 39.6	169 29.2	36.2	160 58.7	15.6	167 41.2	39.2	79 34.4	11.3	274 36.3	92	15 55.5 +104	
10	0	317 42.0	184 28.5	+18 35.4	175 59.6	+16 15.1	182 43.1	+17 39.1	94 36.8	-14 11.3	289 04.5	92	+16 05.9 +103
1	332 44.5	199 27.9	34.6	191 00.5	14.6	197 45.0	38.9	109 39.2	11.4	303 32.7	91	16 16.2 +101	
2	347 46.9	214 27.2	33.9	206 01.4	14.1	212 46.9	38.8	124 41.5	11.4	318 00.8	90	16 26.3 +101	
3	2 49.4	229 26.5	.. 33.1	221 02.3	.. 13.2	227 48.8	.. 38.6	139 43.9	.. 11.4	332 28.8	89	.. 16 36.4 +100	
4	17 51.9	244 25.8	32.3	236 03.2	13.1	242 50.8	38.5	154 46.3	11.5	346 56.7	88	16 46.4 +100	
5	32 54.3	259 25.1	31.5	251 04.1	12.6	257 52.7	38.3	169 48.7	11.5	1 24.5	88	16 56.4 + 98	
6	47 56.8	274 24.4	+18 30.8	266 04.9	+16 12.1	272 54.6	+17 38.2	184 51.1	-14 11.5	15 52.3	86	+17 06.2 + 97	
7	62 59.3	289 23.7	30.0	281 05.8	11.6	287 56.5	38.0	199 53.4	11.6	30 19.9	86	17 15.9 + 97	
8	78 01.7	304 23.1	29.2	296 06.7	11.1	302 58.4	37.9	214 55.8	11.6	44 47.5	85	17 25.6 + 95	
9	93 04.2	319 22.4	.. 28.4	311 07.6	.. 10.6	318 00.3	.. 37.7	229 58.2	.. 11.7	59 15.0	84	.. 17 35.1 + 94	
10	108 06.7	334 21.7	27.6	326 08.5	10.1	333 02.2	37.6	245 00.6	11.7	73 42.4	84	17 44.5 + 94	
11	123 09.1	349 21.0	26.8	341 09.4	09.6	348 04.1	37.4	260 03.0	11.7	88 09.8	82	17 53.9 + 92	
12	138 11.6	4 20.3	+18 26.1	356 10.3	+16 09.1	3 06.0	+17 37.3	275 05.3	-14 11.8	102 37.0	82	+18 03.1 + 92	
13	153 14.0	19 19.7	25.3	11 11.2	08.6	18 07.9	37.1	290 07.7	11.8	117 04.2	81	18 12.3 + 90	
14	168 16.5	34 19.0	24.5	26 12.1	08.1	33 09.8	37.0	305 10.1	11.8	131 31.3	80	18 21.3 + 90	
15	183 19.0	49 18.3	.. 23.7	41 13.0	.. 07.6	48 11.8	.. 36.8	320 12.5	.. 11.9	145 58.3	79	.. 18 30.3 + 88	
16	198 21.4	64 17.6	22.9	56 13.9	07.1	63 13.7	36.7	335 14.9	11.9	160 25.2	78	18 39.1 + 88	
17	213 23.9	79 16.9	22.1	71 14.7	06.6	78 15.6	36.5	350 17.2	11.9	174 52.0	78	18 47.9 + 86	
18	228 26.4	94 16.3	+18 21.3	86 15.6	+16 06.1	93 17.5	+17 36.4	5 19.6	-14 12.0	189 18.8	76	+18 56.5 + 85	
19	243 28.8	109 15.6	20.5	101 16.5	05.6	108 19.4	36.2	20 22.0	12.0	203 45.4	76	19 05.0 + 84	
20	258 31.3	124 14.9	19.7	116 17.4	05.1	123 21.3	36.1	35 24.4	12.1	218 12.0	75	19 13.4 + 83	
21	273 33.8	139 14.2	.. 19.0	131 18.3	.. 04.6	138 23.2	.. 35.9	50 26.8	.. 12.1	232 38.5	74	.. 19 21.7 + 82	
22	288 36.2	154 13.6	18.2	146 19.2	04.1	153 25.1	35.8	65 29.1	12.1	247 04.9	73	19 29.9 + 80	
23	303 38.7	169 12.9	17.4	161 20.1	03.6	168 27.0	35.6	80					

G M T	SUN			STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS			
	GHA	Dec.	No.	Name	SHA	Dec.	N				8	9	10	11	Alt.	Sun's Low'r Limb	Venus	Mars
8	0	178 34.6 +16 25.9	7	Acamar	315 51.2 -40 28.5	72	1 27	///	19 25	18 49	19 25	18 49	19 25	18 49	Alt.	Sun's Low'r Limb	Venus	Mars
1	193 34.7	25.2	5	Achernar	335 58.7 -57 27.3	70	2 18	///	19 42	19 22	19 42	19 22	19 42	19 22	Alt.	Sun's Low'r Limb	Venus	Mars
2	208 34.7	24.5	30	Acruz	173 58.3 -62 51.5	68	2 50	///	19 55	19 46	19 55	19 46	19 55	19 46	Alt.	Sun's Low'r Limb	Venus	Mars
3	223 34.8	23.8	19	Adhara	255 46.9 -28 54.5	66	3 13	///	20 06	20 04	20 06	20 04	20 06	20 04	Alt.	Sun's Low'r Limb	Venus	Mars
4	238 34.9	23.1	10	Aldebaran	291 39.3 +16 25.3	64	3 31	///	20 16	20 19	20 16	20 19	20 16	20 19	Alt.	Sun's Low'r Limb	Venus	Mars
5	253 35.0	22.4				62	3 45	///	20 23	20 32	20 23	20 32	20 23	20 32	Alt.	Sun's Low'r Limb	Venus	Mars
6	268 35.0 +16 21.7		32	Alioth	166 58.9 +56 12.2	60	3 58	///	20 30	20 43	20 30	20 43	20 30	20 43	Alt.	Sun's Low'r Limb	Venus	Mars
7	283 35.1	21.0	34	Alkaid	153 33.1 +49 32.3	58	4 08	///	20 37	20 53	20 37	20 53	20 37	20 53	Alt.	Sun's Low'r Limb	Venus	Mars
8	298 35.2	20.3	55	Al Na'ir	28 37.6 -47 10.4	56	4 18	///	20 42	21 01	20 42	21 01	20 42	21 01	Alt.	Sun's Low'r Limb	Venus	Mars
9	313 35.3	19.6	15	Alnilam	276 30.5 -1 13.6	54	4 26	1 20	20 47	21 08	20 47	21 08	20 47	21 08	Alt.	Sun's Low'r Limb	Venus	Mars
10	328 35.3	18.9	25	Alphard	218 39.0 -8 27.9	52	4 33	1 51	20 51	21 15	20 51	21 15	20 51	21 15	Alt.	Sun's Low'r Limb	Venus	Mars
11	343 35.4	18.2				50	4 39	2 14	20 55	21 21	20 55	21 21	20 55	21 21	Alt.	Sun's Low'r Limb	Venus	Mars
12	358 35.5 +16 17.5		41	Alphecca	126 47.6 +26 52.0	45	4 53	2 52	21 04	21 34	21 04	21 34	21 04	21 34	Alt.	Sun's Low'r Limb	Venus	Mars
13	13 35.6	16.8	1	Alpheratz	358 28.2 +28 50.8	40	5 05	3 19	21 12	21 45	21 12	21 45	21 12	21 45	Alt.	Sun's Low'r Limb	Venus	Mars
14	28 35.7	16.1	51	Altair	62 50.2 +8 45.2	35	5 15	3 39	21 18	21 54	21 18	21 54	21 18	21 54	Alt.	Sun's Low'r Limb	Venus	Mars
15	43 35.7	15.4	2	Ankaa	353 58.1 -42 32.4	30	5 23	3 55	21 24	22 03	21 24	22 03	21 24	22 03	Alt.	Sun's Low'r Limb	Venus	Mars
16	58 35.8	14.6	42	Antares	113 19.3 -26 20.2	20	5 38	4 18	21 34	22 17	21 34	22 17	21 34	22 17	Alt.	Sun's Low'r Limb	Venus	Mars
17	73 35.9	13.9				10	5 50	4 36	21 42	22 30	21 42	22 30	21 42	22 30	Alt.	Sun's Low'r Limb	Venus	Mars
18	88 36.0 +16 13.2		37	Arcturus	146 35.3 +19 24.9	0	6 02	4 50	21 51	22 42	21 51	22 42	21 51	22 42	Alt.	Sun's Low'r Limb	Venus	Mars
19	103 36.1	12.5	43	Atria	108 59.8 -68 57.2	10	6 14	5 02	21 59	22 53	21 59	22 53	21 59	22 53	Alt.	Sun's Low'r Limb	Venus	Mars
20	118 36.1	11.8	22	Avior	234 36.5 -59 22.0	20	6 26	5 12	22 08	23 06	22 08	23 06	22 08	23 06	Alt.	Sun's Low'r Limb	Venus	Mars
21	133 36.2	11.1	13	Bellatrix	279 18.7 +6 18.7	30	6 40	5 19	22 18	23 21	22 18	23 21	22 18	23 21	Alt.	Sun's Low'r Limb	Venus	Mars
22	148 36.3	10.4	16	Betelgeuse	271 48.4 +7 24.1	35	6 48	5 23	22 24	23 30	22 24	23 30	22 24	23 30	Alt.	Sun's Low'r Limb	Venus	Mars
23	163 36.4	09.7				40	6 57	5 26	22 31	23 40	22 31	23 40	22 31	23 40	Alt.	Sun's Low'r Limb	Venus	Mars
			17	Canopus	264 15.8 -52 40.0	45	7 07	5 29	22 39	23 51	22 39	23 51	22 39	23 51	Alt.	Sun's Low'r Limb	Venus	Mars
9	0	178 36.5 +16 09.0	12	Capella	281 38.8 +45 57.2	50	7 20	5 31	22 48	24 05	22 48	24 05	22 48	24 05	Alt.	Sun's Low'r Limb	Venus	Mars
1	193 36.5	08.3	53	Deneb	50 00.6 +45 07.4	52	7 26	5 32	22 53	24 12	22 53	24 12	22 53	24 12	Alt.	Sun's Low'r Limb	Venus	Mars
2	208 36.6	07.6	28	Denebola	183 18.0 +14 49.2	54	7 32	5 32	22 58	24 20	22 58	24 20	22 58	24 20	Alt.	Sun's Low'r Limb	Venus	Mars
3	223 36.7	06.9	4	Diphda	349 39.1 -18 13.5	56	7 40	5 33	23 03	24 28	23 03	24 28	23 03	24 28	Alt.	Sun's Low'r Limb	Venus	Mars
4	238 36.8	06.1				58	7 48	5 34	23 09	24 37	23 09	24 37	23 09	24 37	Alt.	Sun's Low'r Limb	Venus	Mars
5	253 36.9	05.4	27	Dubhe	194 45.2 +61 59.5	60	7 57	5 35	23 16	24 48	23 16	24 48	23 16	24 48	Alt.	Sun's Low'r Limb	Venus	Mars
6	268 37.0 +16 04.7		14	Elnath	279 07.6 +28 34.3	S									Alt.	Sun's Low'r Limb	Venus	Mars
7	283 37.0	04.0	47	Eltanin	91 05.9 +51 29.9										Alt.	Sun's Low'r Limb	Venus	Mars
8	298 37.1	03.3	54	Enif	34 29.3 +9 40.4										Alt.	Sun's Low'r Limb	Venus	Mars
9	313 37.2	02.6	56	Fomalhaut	16 11.3 -29 51.2										Alt.	Sun's Low'r Limb	Venus	Mars
10	328 37.3	01.9													Alt.	Sun's Low'r Limb	Venus	Mars
11	343 37.4	01.2	31	Gacrux	172 49.7 -56 52.2	72	22 35	///	11 25	13 45	11 25	13 45	11 25	13 45	Alt.	Sun's Low'r Limb	Venus	Mars
12	358 37.5 +16 00.4		29	Gienah	176 37.2 -17 17.8	70	21 48	///	11 10	13 14	11 10	13 14	11 10	13 14	Alt.	Sun's Low'r Limb	Venus	Mars
13	13 37.5	15 59.7	35	Hadar	149 49.7 -60 09.9	68	21 18	///	10 59	12 52	10 59	12 52	10 59	12 52	Alt.	Sun's Low'r Limb	Venus	Mars
14	28 37.6	59.0	6	Hamal	328 49.6 +23 15.3	66	20 56	///	10 50	12 35	10 50	12 35	10 50	12 35	Alt.	Sun's Low'r Limb	Venus	Mars
15	43 37.7	58.3	48	Kaus Aust.	84 41.0 -34 24.5	64	20 38	///	10 42	12 21	10 42	12 21	10 42	12 21	Alt.	Sun's Low'r Limb	Venus	Mars
16	58 37.8	57.6				62	20 24	///	10 35	12 09	10 35	12 09	10 35	12 09	Alt.	Sun's Low'r Limb	Venus	Mars
17	73 37.9	56.9	40	Kochab	137 17.9 +74 20.5	60	20 12	///	10 29	11 59	10 29	11 59	10 29	11 59	Alt.	Sun's Low'r Limb	Venus	Mars
18	88 38.0 +15 56.1		57	Markab	14 21.2 +14 58.1	58	20 01	///	10 24	11 51	10 24	11 51	10 24	11 51	Alt.	Sun's Low'r Limb	Venus	Mars
19	103 38.1	55.4	8	Menkar	315 00.4 +3 55.2	56	19 52	23 42	10 20	11 43	10 20	11 43	10 20	11 43	Alt.	Sun's Low'r Limb	Venus	Mars
20	118 38.1	54.7	36	Menkent	148 58.8 -36 09.4	54	19 44	22 44	10 16	11 36	10 16	11 36	10 16	11 36	Alt.	Sun's Low'r Limb	Venus	Mars
21	133 38.2	54.0	24	Miapl'dus	221 50.0 -69 32.1	52	19 37	22 15	10 12	11 30	10 12	11 30	10 12	11 30	Alt.	Sun's Low'r Limb	Venus	Mars
22	148 38.3	53.3				50	19 31	21 54	10 09	11 25	10 09	11 25	10 09	11 25	Alt.	Sun's Low'r Limb	Venus	Mars
23	163 38.4	52.5	9	Mirfak	309 42.5 +49 42.2	45	19 17	21 16	10 02	11 13	10 02	11 13	10 02	11 13	Alt.	Sun's Low'r Limb	Venus	Mars
			50	Nunki	76 51.7 -26 21.2	40	19 05	20 50	9 56	11 03	19 05	20 50	9 56	11 03	Alt.	Sun's Low'r Limb	Venus	Mars
10	0	178 38.5 +15 51.8	52	Peacock	54 26.8 -56 52.7	35	18 56	20 31	9 50	10 55	18 56	20 31	9 50	10 55	Alt.	Sun's Low'r Limb	Venus	Mars
1	193 38.6	51.1	21	Pollux	244 21.0 +28 08.1	30	18 47	20 15	9 46	10 48	18 47	20 15	9 46	10 48	Alt.	Sun's Low'r Limb	Venus	Mars
2	208 38.7	50.4	20	Procyon	245 45.4 +5 20.4	20	18 33	19 51	9 38	10 35	18 33	19 51	9 38	10 35	Alt.	Sun's Low'r Limb	Venus	Mars
3	223 38.8	49.7				10	18 21	19 34	9 31	10 25	18 21	19 34	9 31	10 25	Alt.	Sun's Low'r Limb	Venus	Mars
4	238 38.8	48.9	46	R'alhague	96 46.5 +12 35.6	0	18 09	19 20	9 25	10 14	18 09	19 20	9 25	10 14	Alt.	Sun's Low'r Limb	Venus	Mars
5	253 38.9	48.2	26	Regulus	208 29.9 +12 11.1	10	17 58	19 10	9 19	10 04	17 58	19 10	9 19	10 04	Alt.	Sun's Low'r Limb	Venus	Mars
6	268 39.0 +15 47.5		11	Rigel	281 53.9 -8 14.9	20	17 46	19 01	9 12	9 54	17 46	19 01	9 12	9 54	Alt.	Sun's Low'r Limb	Venus	Mars
7	283 39.1	46.8	38	Rigil Kent.	140 51.2 -60 39.6	30	17 32	18 54	9 04	9 41	17 32	18 54	9 04	9 41	Alt.	Sun's Low'r Limb	Venus	Mars
8	298 39.2	46.0	44	Sabik	103 02.1 -15 40.3	35	17 24	18 50	9 00	9 34	17 24	18 50	9 00	9 34	Alt.	Sun's Low'r Limb	Venus	Mars
9	313 39.3	45.3				40	17 15	18 47	8 55	9 26	17 15	18 47	8 55	9 26	Alt.	Sun's Low'r Limb	Venus	Mars
10	328 39.4	44.6	3	Schedar	350 29.7 +56 17.6	45	17 05	18 45	8 49	9 17	17 05	18 45	8 49	9 17	Alt.	Sun's Low'r Limb	Venus	Mars
11	343 39.5	43.9	45	Shaula	97 20.5 -37 04.5	50	16 52	18 43	8 42	9 06	16 52	18 43	8 42	9 06	Alt.	Sun's Low'r Limb	Venus	Mars
12	358 39.6 +15 43.1		18	Sirius	259 12.2 -16 39.1	52	16 46	18 42	8 39	9 01	16 46	18 42	8 39	9 01	Alt.	Sun's Low'r Limb	Venus	Mars
13	13 39.6	42.4	33	Spica	159 17.1 -10 55.9	54	16 40	18 40	8 36	8 55	16 40	18 40	8 36	8 55	Alt.	Sun's Low'r Limb	Venus	Mars
14	28 39.7	41.7	23	Suhail	223 24.8 -43 15.2	56	16 32	18 40	8 32	8 49	16 32	18 40	8 32	8 49	Alt.	Sun's Low'r Limb	Venus	Mars
15	43 39.8	41.0				58	16 24	18 40	8 28	8 42	16 24	18 40	8 28	8 42	Alt.	Sun's Low'r Limb	Venus	Mars
16	58 39.9	40.2	49	Vega	81 08.0 +38 44.7	60	16 15											

G M T	T GHA	VENUS — 3.4			MARS 2.0			JUPITER — 1.3			SATURN 0.8			MOON			
		GHA	Dec.		GHA	Dec.		GHA	Dec.		GHA	Dec.		GHA	code	Dec.	code
h	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
11	0	318 41.2	184 12.2	+18 16.6	176 21.0	+16 03.1		183 28.9	+17 35.5		95 33.9	-14 12.2		275 57.5	72	+19 45.9	+ 78
	1	333 43.6	199 11.5	15.8	191 21.9	02.6		198 30.9	35.3		110 36.3	12.2		290 23.7	70	19 53.7	+ 77
	2	348 46.1	214 10.9	15.0	206 22.8	02.1		213 32.8	35.1		125 38.6	12.3		304 49.7	71	20 01.4	+ 76
	3	3 48.5	229 10.2	.. 14.2	221 23.7	.. 01.6		228 34.7	.. 35.0		140 41.0	.. 12.3		319 15.8	69	20 09.0	+ 75
	4	18 51.0	244 09.5	13.4	236 24.6	01.1		243 36.6	34.8		155 43.4	12.3		333 41.7	68	20 16.5	+ 74
	5	33 53.5	259 08.9	12.6	251 25.5	00.6		258 38.5	34.7		170 45.8	12.4		348 07.5	68	20 23.9	+ 72
	6	48 55.9	274 08.2	+18 11.8	266 26.3	+16 00.1		273 40.4	+17 34.5		185 48.2	-14 12.4		2 33.3	67	+20 31.1	+ 71
	7	63 58.4	289 07.5	11.0	281 27.2	15 59.6		288 42.3	34.4		200 50.5	12.5		16 59.0	66	20 38.2	+ 70
	8	79 00.9	304 06.8	10.2	296 28.1	59.1		303 44.2	34.2		215 52.9	12.5		31 24.6	65	20 45.2	+ 68
	9	94 03.3	319 06.2	.. 09.4	311 29.0	.. 58.6		318 46.1	.. 34.1		230 55.3	.. 12.5		45 50.1	64	20 52.0	+ 68
	10	109 05.8	334 05.5	08.6	326 29.9	58.1		333 48.0	33.9		245 57.7	12.6		60 15.5	64	20 58.8	+ 66
	11	124 08.3	349 04.8	07.8	341 30.8	57.6		348 49.9	33.8		261 00.0	12.6		74 40.9	63	21 05.4	+ 64
	12	139 10.7	4 04.2	+18 07.0	356 31.7	+15 57.1		3 51.9	+17 33.6		276 02.4	-14 12.6		89 06.2	62	+21 11.8	+ 64
	13	154 13.2	19 03.5	06.1	11 32.6	56.6		18 53.8	33.5		291 04.8	12.7		103 31.4	62	21 18.2	+ 62
	14	169 15.7	34 02.8	05.3	26 33.5	56.1		33 55.7	33.3		306 07.2	12.7		117 56.6	61	21 24.4	+ 60
	15	184 18.1	49 02.2	.. 04.5	41 34.4	.. 55.6		48 57.6	.. 33.2		321 09.5	.. 12.8		132 21.7	59	21 30.4	+ 60
	16	199 20.6	64 01.5	03.7	56 35.3	55.0		63 59.5	33.0		336 11.9	12.8		146 46.6	60	21 36.4	+ 57
	17	214 23.0	79 00.8	02.9	71 36.2	54.5		79 01.4	32.9		351 14.3	12.8		161 11.6	58	21 42.1	+ 57
	18	229 25.5	94 00.2	+18 02.1	86 37.1	+15 54.0		94 03.3	+17 32.7		6 16.7	-14 12.9		175 36.4	58	+21 47.8	+ 55
	19	244 28.0	108 59.5	01.3	101 38.0	53.5		109 05.2	32.6		21 19.0	12.9		190 01.2	57	21 53.3	+ 54
	20	259 30.4	123 58.8	18 00.5	116 38.9	53.0		124 07.1	32.4		36 21.4	12.9		204 25.9	57	21 58.7	+ 52
	21	274 32.9	138 58.2	-17 59.7	131 39.8	.. 52.5		139 09.1	.. 32.3		51 23.8	.. 13.0		218 50.6	56	-22 03.9	+ 51
	22	289 35.4	153 57.5	58.8	146 40.7	52.0		154 11.0	32.1		66 26.2	13.0		233 15.2	55	22 09.0	+ 50
	23	304 37.8	168 56.8	58.0	161 41.5	51.5		169 12.9	32.0		81 28.5	13.1		247 39.7	54	22 14.0	+ 48
12	0	319 40.3	183 56.2	+17 57.2	176 42.4	+15 51.0		184 14.8	+17 31.8		96 30.9	-14 13.1		262 04.1	54	+22 18.8	+ 46
	1	334 42.8	198 55.5	56.4	191 43.3	50.5		199 16.7	31.6		111 33.3	13.1		276 28.5	53	22 23.4	+ 46
	2	349 45.2	213 54.8	55.6	206 44.2	50.0		214 18.6	31.5		126 35.7	13.2		290 52.8	53	22 28.0	+ 43
	3	4 47.7	228 54.2	.. 54.8	221 45.1	.. 49.5		229 20.5	.. 31.3		141 38.0	.. 13.2		305 17.1	52	22 32.3	+ 42
	4	19 50.2	243 53.5	53.9	236 46.0	49.0		244 22.4	31.2		156 40.4	13.2		319 41.3	51	22 36.5	+ 41
	5	34 52.6	258 52.9	53.1	251 46.9	48.5		259 24.3	31.0		171 42.8	13.3		334 05.4	51	22 40.6	+ 39
	6	49 55.1	273 52.2	+17 52.3	266 47.8	+15 48.0		274 26.2	+17 30.9		186 45.2	-14 13.3		348 29.5	50	+22 44.5	+ 38
	7	64 57.5	288 51.5	51.5	281 48.7	47.5		289 28.2	30.7		201 47.5	13.4		2 53.5	50	22 48.3	+ 36
	8	80 00.0	303 50.9	50.6	296 49.6	46.9		304 30.1	30.6		216 49.9	13.4		17 17.5	49	22 51.9	+ 35
	9	95 02.5	318 50.2	.. 49.8	311 50.5	.. 46.4		319 32.0	.. 30.4		231 52.3	.. 13.4		31 41.4	49	22 55.4	+ 33
	10	110 04.9	333 49.5	49.0	326 51.4	45.9		334 33.9	30.3		246 54.6	13.5		46 05.3	48	22 58.7	+ 31
	11	125 07.4	348 48.9	48.2	341 52.3	45.4		349 35.8	30.1		261 57.0	13.5		60 29.1	48	23 01.8	+ 30
	12	140 09.9	3 48.2	+17 47.3	356 53.2	+15 44.9		4 37.7	+17 30.0		276 59.4	-14 13.5		74 52.9	47	+23 04.8	+ 29
	13	155 12.3	18 47.6	46.5	11 54.1	44.4		19 39.6	29.8		292 01.8	13.6		89 16.6	47	23 07.7	+ 27
	14	170 14.8	33 46.9	45.7	26 55.0	43.9		34 41.5	29.7		307 04.1	13.6		103 40.3	46	23 10.4	+ 25
	15	185 17.3	48 46.3	.. 44.9	41 55.9	.. 43.4		49 43.4	.. 29.5		322 06.5	.. 13.7		118 03.9	46	23 12.9	+ 24
	16	200 19.7	63 45.6	44.0	56 56.8	42.9		64 45.4	29.4		337 08.9	13.7		132 27.5	45	23 15.3	+ 22
	17	215 22.2	78 44.9	43.2	71 57.7	42.4		79 47.3	29.2		352 11.2	13.7		146 51.0	46	23 17.5	+ 21
	18	230 24.7	93 44.3	+17 42.4	86 58.6	+15 41.9		94 49.2	+17 29.1		7 13.6	-14 13.8		161 14.6	44	+23 19.6	+ 19
	19	245 27.1	108 43.6	41.4	101 59.5	41.4		109 51.1	28.9		22 16.0	13.8		175 38.0	45	23 21.5	+ 17
	20	260 29.6	123 43.0	40.7	117 00.4	40.8		124 53.0	28.8		37 18.4	13.8		190 01.5	44	23 23.2	+ 16
	21	275 32.0	138 42.3	.. 39.9	132 01.3	.. 40.3		139 54.9	.. 28.6		52 20.7	.. 13.9		204 24.9	43	23 24.8	+ 14
	22	290 34.5	153 41.7	39.8	147 02.2	39.8		154 56.8	28.4		67 23.1	13.9		218 48.2	44	23 26.2	+ 12
	23	305 37.0	168 41.0	38.2	162 03.1	39.3		169 58.7	28.3		82 25.5	14.0		233 11.6	43	23 27.4	+ 11
13	0	320 39.4	183 40.4	+17 37.3	177 04.0	+15 38.8		185 00.6	+17 28.1		97 27.8	-14 14.0		247 34.9	43	+23 28.5	+ 10
	1	335 41.9	198 39.7	36.5	192 04.9	38.3		200 02.6	28.0		112 30.2	14.0		261 58.2	42	23 29.5	+ 7
	2	350 44.4	213 39.1	35.7	207 05.8	37.8		215 04.5	27.8		127 32.6	14.1		276 21.4	43	23 30.2	+ 6
	3	5 46.8	228 38.4	.. 37.3	222 06.7	.. 37.3		230 06.4	.. 27.7		142 34.9	.. 14.1		290 44.7	42	23 30.8	+ 5
	4	20 49.3	243 37.8	34.0	237 07.6	36.8		245 08.3	27.5		157 37.3	14.2		305 07.9	42	23 31.3	+ 3
	5	35 51.8	258 37.1	33.1	252 08.5	36.2		260 10.2	27.4		172 39.7	14.2		319 31.1	42	23 31.6	+ 1
	6	50 54.2	273 36.5	+17 32.3	267 09.4	+15 35.7		275 12.1	+17 27.2		187 42.1	-14 14.2		333 54.3	41	+23 31.7	- 1
	7	65 56.7	288 35.8	31.5	282 10.3	35.2		290 14.0	27.1		202 44.4	14.3		348 17.4	42	23 31.6	- 2
	8	80 59.1	303 35.2	30.6	297 11.2	34.7		305 15.9	26.9		217 46.8	14.3		2 40.6	41	23 31.4	- 4
	9	96 01.6	318 34.5	.. 29.8	312 12.1	.. 34.2		320 17.8	.. 26.8		232 49.2	.. 14.4		17 03.7	41	23 31.0	- 5
	10	111 04.1	333 33.9	28.9	327 13.0	33.7		335 19.8	26.6		247 51.5	14.4		31 26.8	41	23 30.5	- 7
	11	126 06.5	348 33.2	28.1	342 13.9	33.2		350 21.7	26.5		262 53.9	14.4		45 49.9	42	23 29.8	- 9
	12	141 09.0	3 32.6	+17 27.2	357 14.8	+15 32.7		5 23.6	+17 26.3		277 56.3	-14 14.5		60 13.1	41	+23 28.9	- 10
	13	156 11.5	18 31.9	26.4	12 15.7	32.1		20 25.5	26.2		292 58.6	14.5		74 36.2	41	23 27.9	- 12
	14	171 13.9	33 31.3	25.5	27 16.6	31.6		35 27.4	26.0		308 01.0	14.6		88 59.3	41	23 26.7	- 14
	15	186 16.4	48 30.6	.. 24.7	42 17.5	.. 31.1		50 29.3	.. 25.8		323 03.4	.. 14.6		103 22.4	41	23 25.3	- 16
	16	201 18.9	63 30.0	23.8	57 18.4	30.6		65 31.2	25.7		338 05.7	14.6		117 45.5	41	23 23.7	- 16
	17	216 21.3	78 29.3	23.0	72 19.3	30.1		80 33.1	25.5		353 08.1	14.7		132 08.6	41	23 22.1	- 19
	18	231 23.8	93 28.7	+17 22.1	87 20.2	+15 29.6		95 35.0	+17 25.4		8 10.5	-14 14.7		146 31.7	41	+23 20.2	- 20
	19	246 26.3	108 28.1	21.3	102 21.1	29.1		110 37.0	25.2		23 12.8	14.7		160 54.8	42	23 18.2	- 22
	20	261 28.7	123 27.4	20.4	117 22.0	28.6		125 38.9	25.1		38 15.2	14.8		175 18.0	41	23 16.0	- 24
	21	276 31.2	138 26.8	.. 19.6	132 22.9	.. 28.0		140 40.8	.. 24.9		53 17.6	.. 14.8		189 41.			

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS			
	GHA	Dec.	No.	Name	SHA	Dec.				11	12	13	14				
	h	m								h m	h m	h m	h m				
11	0	178 40.7	+15 34.4	7 Acamar	315 51.1	-40 28.5	72	1 55	////	□	□	□	□	Alt.	Sun's	Venus	Mars
	1	193 40.7	33.7	5 Achernar	335 58.6	-57 27.3	70	2 36	////	□	□	□	□		Low'r		
	2	208 40.8	32.9	30 Acrux	173 58.4	-62 51.5	68	3 03	////	18 57	□	□	22 29		Add	Add	Add
	3	223 40.9	32.2	19 Adhara	255 46.9	-28 54.5	66	3 24	////	20 06	20 21	21 31	23 26				
	4	238 41.0	31.5	10 Aldebaran	291 39.3	+16 25.3	64	3 40	////	20 42	21 16	22 22	23 59	0			
	5	253 41.1	30.7				62	3 53	////	21 08	21 48	22 54	24 23	30	0.1	0.1	0.1
	6	268 41.2	+15 30.0	32 Alioth	166 58.9	+56 12.2	60	4 05	////	21 29	22 13	23 18	24 43	45	0.1	0.1	0.0
	7	283 41.3	29.3	34 Alkaid	153 33.1	+49 32.3	58	4 15	////	21 46	22 32	23 37	24 59	60	0.1	0.0	0.0
	8	298 41.4	28.5	55 Al Na'ir	28 37.5	-47 10.4	56	4 23	0 52	22 00	22 48	23 53	25 12	75	0.1	0.0	0.0
	9	313 41.5	27.8	15 Alnilam	276 30.5	-1 13.6	54	4 31	1 36	22 12	23 02	24 07	0 07	90	0.0		
	10	328 41.6	27.1	25 Alphard	218 39.0	-8 27.9	52	4 38	2 02	22 23	23 14	24 19	0 19				
	11	343 41.7	26.3				50	4 44	2 22	22 33	23 25	24 29	0 29				
	12	358 41.8	+15 25.6	41 Alphecca	126 47.6	+26 52.0	45	4 57	2 58	22 54	23 47	24 51	0 51	Moon's Lower Limb			
	13	13 41.9	24.9	1 Alpheratz	358 28.1	+28 50.8	40	5 08	3 23	23 10	24 05	0 05	1 09	Add			
	14	28 42.0	24.1	51 Altair	62 50.2	+8 45.2	35	5 17	3 42	23 25	24 21	0 21	1 24	Alt.	11	12	13
	15	43 42.1	23.4	2 Ankaa	353 58.0	-42 32.4	30	5 25	3 57	23 37	24 34	0 34	1 37	0			
	16	58 42.2	22.6	42 Antares	113 19.3	-26 20.2	20	5 39	4 20	23 58	24 56	0 56	1 59	4	18.3	18.7	19.1
	17	73 42.3	21.9				10	5 51	4 38	24 16	0 16	1 16	2 18	8	18.3	18.7	19.1
	18	88 42.4	+15 21.2	37 Arcturus	146 35.3	+19 24.9	0	6 02	4 51	24 34	0 34	1 34	2 36	12	18.3	18.7	19.1
	19	103 42.5	20.4	43 Atria	108 59.9	-68 57.2	10	6 13	5 01	24 51	0 51	1 53	2 54	16	18.3	18.7	19.0
	20	118 42.6	19.7	22 Avior	234 36.4	-59 21.9	20	6 24	5 10	0 07	1 10	2 12	3 13	20	18.2	18.6	19.0
	21	133 42.7	18.9	13 Bellatrix	279 18.7	+6 18.7	30	6 37	5 17	0 26	1 31	2 35	3 35	24	18.2	18.6	18.9
	22	148 42.8	18.2	16 Betelge'se	271 48.4	+7 24.1	35	6 45	5 20	0 37	1 44	2 48	3 48	28	18.1	18.5	18.8
	23	163 42.8	17.5				40	6 53	5 22	0 50	1 59	3 04	4 02	32	18.1	18.4	18.7
				17 Canopus	264 15.8	-52 40.0	45	7 03	5 24	1 04	2 16	3 22	4 20	36	18.0	18.3	18.6
12	0	178 43.0	+15 16.7	12 Capella	281 38.8	+45 57.2	50	7 15	5 26	1 23	2 38	3 45	4 42	40	17.9	18.2	18.5
	1	193 43.0	16.0	53 Deneb	50 00.6	+45 07.5	52	7 20	5 27	1 32	2 48	3 56	4 52	44	17.8	18.1	18.4
	2	208 43.1	15.2	28 Denebola	183 18.0	+14 49.2	54	7 27	5 27	1 41	3 00	4 09	5 04	48	17.7	18.0	18.3
	3	223 43.2	14.5	4 Diphda	349 39.1	-18 13.5	56	7 33	5 27	1 52	3 13	4 23	5 17	52	17.6	17.8	18.1
	4	238 43.3	13.8				58	7 41	5 28	2 05	3 29	4 40	5 33	56	17.4	17.7	18.0
	5	253 43.4	13.0	27 Dubhe	194 45.2	+61 59.5	60	7 49	5 28	2 20	3 47	5 00	5 51	60	17.3	17.6	17.8
	6	268 43.5	+15 12.3	14 Elnath	279 07.6	+28 34.3	S							64	17.2	17.4	17.6
	7	283 43.6	11.5	47 Eltanin	91 05.9	+51 29.9								68	17.0	17.2	17.5
	8	298 43.7	10.8	54 Enif	34 29.3	+9 40.4								72	16.9	17.1	17.3
	9	313 43.8	10.0	56 Fomalhaut	16 11.3	-29 51.2								76	16.8	16.9	17.1
	10	328 43.9	09.3											80	16.6	16.8	16.9
	11	343 44.0	08.5	31 Gacrux	172 49.7	-56 52.2	72	22 08	////	□	□	□	□	84	16.5	16.6	16.7
	12	358 44.1	+15 07.8	29 Gienah	176 37.2	-17 17.8	70	21 30	////	□	□	□	□	88	16.3	16.4	16.5
	13	13 44.3	07.1	35 Hadar	149 49.7	-60 09.9	68	21 04	////	17 31	□	□	20 22	90	16.2	16.3	16.4
	14	28 44.4	06.3	6 Hamal	328 49.6	+23 15.3	66	20 44	////	16 22	18 12	19 12	19 25		Add to table, back cover		
	15	43 44.5	05.6	48 Kaus Aust.	84 41.0	-34 24.5	64	20 28	////	15 47	17 18	18 20	18 51		Moon's Upper Limb		
	16	58 44.6	04.8				62	20 15	////	15 21	16 46	17 48	18 26		Subtract		
	17	73 44.7	04.1	40 Kochab	137 18.0	+74 20.5	60	20 04	////	15 01	16 22	17 24	18 06	Alt.	11	12	13
	18	88 44.8	+15 03.3	57 Markab	14 21.2	+14 58.1	58	19 54	////	14 44	16 02	17 05	17 50	0			
	19	103 44.9	02.6	8 Menkar	315 00.4	+3 55.2	56	19 45	23 07	14 31	15 46	16 49	17 36	4	14.0	13.7	13.5
	20	118 45.0	01.8	36 Menkent	148 58.9	-36 09.3	54	19 38	22 28	14 19	15 33	16 35	17 24	8	14.0	13.7	13.5
	21	133 45.1	01.1	24 Miapl'dus	221 50.0	-69 32.1	52	19 31	22 03	14 08	15 21	16 23	17 13	12	14.0	13.8	13.6
	22	148 45.2	15 00.3				50	19 25	21 44	13 58	15 10	16 12	17 03	16	14.1	13.9	13.6
	23	163 45.3	14 59.6	9 Mirfak	309 42.5	+49 42.2	45	19 12	21 09	13 39	14 48	15 50	16 43	20	14.1	13.9	13.7
				50 Neunki	76 51.7	-26 21.2	40	19 02	20 45	13 22	14 30	15 32	16 27	24	14.2	14.0	13.8
13	0	178 45.4	+14 58.8	52 Peacock	54 26.8	-56 52.7	35	18 53	20 27	13 09	14 15	15 17	16 13	28	14.2	14.1	13.9
	1	193 45.5	58.1	21 Pollux	244 21.0	+28 08.1	30	18 45	20 12	12 57	14 02	15 04	16 01	32	14.3	14.2	14.0
	2	208 45.6	57.3	20 Procyon	245 45.3	+5 20.4	20	18 31	19 49	12 37	13 40	14 41	15 40	36	14.4	14.3	14.1
	3	223 45.7	56.6				10	18 19	19 32	12 19	13 20	14 22	15 22	40	14.5	14.4	14.2
	4	238 45.8	55.8	46 R'alhague	96 46.5	+12 35.6	0	18 08	19 19	12 03	13 02	14 04	15 05	44	14.6	14.5	14.4
	5	253 45.9	55.0	26 Regulus	208 29.9	+12 11.1	10	17 58	19 10	11 47	12 44	13 45	14 48	48	14.7	14.6	14.5
	6	268 46.0	+14 54.3	11 Rigel	281 53.9	-8 14.9	20	17 46	19 01	11 29	12 25	13 26	14 29	52	14.9	14.8	14.7
	7	283 46.1	53.5	38 Rigil Kent.	140 51.2	-60 39.6	30	17 33	18 54	11 09	12 03	13 03	14 08	56	15.0	14.9	14.8
	8	298 46.2	52.8	44 Sabik	103 02.1	-15 40.3	35	17 26	18 52	10 58	11 50	12 50	13 56	60	15.1	15.1	15.0
	9	313 46.3	52.0				40	17 18	18 50	10 44	11 35	12 34	13 41	64	15.3	15.2	15.2
	10	328 46.4	51.3	3 Schedar	350 29.7	+56 17.6	45	17 08	18 48	10 29	11 17	12 16	13 24	68	15.4	15.4	15.4
	11	343 46.5	50.5	45 Shaula	97 20.5	-37 04.5	50	16 56	18 46	10 09	10 55	11 53	13 03	72	15.5	15.5	15.5
	12	358 46.7	+14 49.8	18 Sirius	259 12.2	-16 39.1	52	16 51	18 46	10 00	10 44	11 42	12 52	76	15.7	15.7	15.7
	13	13 46.8	49.0	33 Spica	159 17.1	-10 55.9	54	16 45	18 46	9 50	10 33	11 30	12 41	80	15.8	15.9	15.9
	14	28 46.9	48.2	23 Suhail	223 24.8	-43 15.2	56	16 38	18 45	9 38	10 19	11 15	12 28	84	16.0	16.1	16.1
	15	43 47.0	47.5				58	16 30	18 45	9 25	10 03	10 59	12 13	88	16.1	16.2	16.3
	16	58 47.1	46.7	49 Vega	81 08.0	+38 44.7	60	16 22	18 46	9 10	9 44	10 38	11 55	90			
	17	73 47.2	46.0	39 Zub'lg'bi	137 53.5	-15 51.6	S								Subtract from table, back cover		
	18	88 47.3	+14 45.2												Last Quarter		
	19	103 47.4	44.5														
	20	118 47.5	43.7														
	21	133 47.6	42.9														
	22	148 47.7	42.2														
	23	163 47.8	41.4														
	24	178 48.0	+14 40.6														
code	-	-	- 7														

G M T	VENUS — 3.4		MARS 2.0		JUPITER — 1.3		SATURN 0.8		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
14 0	321 38.6	183 24.8	+17 17.0	177 25.6	+15 26.5	185 46.5	+17 24.5	98 24.7	-14 14.9	232 50.6	43 +23 05.6	- 30
1 1	336 41.0	198 24.2	16.1	192 26.5	26.0	200 48.4	24.3	113 27.0	15.0	247 13.9	42 23 02.6	- 32
2 2	351 43.5	213 23.6	15.3	207 27.4	25.5	215 50.3	24.2	128 29.4	15.0	261 37.1	42 22 59.4	- 33
3 3	6 46.0	228 22.9	.. 14.4	222 28.3	.. 25.0	230 52.3	.. 24.0	143 31.8	.. 15.1	276 00.3	43 -22 56.1	- 35
4 4	21 48.4	243 22.3	13.5	237 29.2	24.4	245 54.2	23.9	158 34.1	15.1	290 23.6	43 22 52.6	- 37
5 5	36 50.9	258 21.6	12.7	252 30.1	23.9	260 56.1	23.7	173 36.5	15.1	304 46.9	43 22 48.9	- 38
6 6	51 53.4	273 21.0	+17 11.8	267 31.0	+15 23.4	275 58.0	+17 23.6	188 38.9	-14 15.2	319 10.2	44 +22 45.1	- 39
7 7	66 55.8	288 20.4	11.0	282 31.9	22.9	290 59.9	23.4	203 41.2	15.2	333 33.6	44 22 41.2	- 42
8 8	81 58.3	303 19.7	10.1	297 32.8	22.4	306 01.8	23.2	218 43.6	15.3	347 57.0	44 22 37.0	- 43
9 9	97 00.8	318 19.1	.. 09.2	312 33.7	.. 21.9	321 03.7	.. 23.1	233 46.0	.. 15.3	2 20.4	45 -22 32.7	- 44
10 10	112 03.2	333 18.4	08.4	327 34.6	21.3	336 05.6	22.9	248 48.3	15.3	16 43.9	45 22 28.3	- 46
11 11	127 05.7	348 17.8	07.5	342 35.5	20.8	351 07.5	22.8	263 50.7	15.4	31 07.4	45 22 23.7	- 47
12 12	142 08.1	3 17.2	+17 06.6	357 36.4	+15 20.3	6 09.5	+17 22.6	278 53.1	-14 15.4	45 30.9	46 +22 19.0	- 50
13 13	157 10.6	18 16.5	05.7	12 37.3	19.8	21 11.4	22.5	293 55.4	15.5	59 54.5	46 22 14.0	- 50
14 14	172 13.1	33 15.9	04.9	27 38.2	19.3	36 13.3	22.3	308 57.8	15.5	74 18.1	47 22 09.0	- 52
15 15	187 15.5	48 15.3	.. 04.0	42 39.1	.. 18.8	51 15.2	.. 22.2	324 00.2	.. 15.5	88 41.8	47 -22 03.8	- 54
16 16	202 18.0	63 14.6	03.1	57 40.0	18.2	66 17.1	22.0	339 02.5	15.6	103 05.5	47 21 58.4	- 55
17 17	217 20.5	78 14.0	02.3	72 40.9	17.7	81 19.0	21.9	354 04.9	15.6	117 29.2	48 21 52.9	- 57
18 18	232 22.9	93 13.4	+17 01.4	87 41.8	+15 17.2	96 20.9	+17 21.7	9 07.2	-14 15.7	131 53.0	49 +21 47.2	- 58
19 19	247 25.4	108 12.7	17 00.5	102 42.7	16.7	111 22.8	21.6	24 09.6	15.7	146 16.9	49 21 41.4	- 60
20 20	262 27.9	123 12.1	16 59.6	117 43.6	16.2	126 24.8	21.4	39 12.0	15.7	160 40.8	49 21 35.4	- 61
21 21	277 30.3	138 11.5	.. 58.8	132 44.5	.. 15.7	141 26.7	.. 21.3	54 14.3	.. 15.8	175 04.7	50 -21 29.3	- 63
22 22	292 32.8	153 10.8	57.9	147 45.4	15.1	156 28.6	21.1	69 16.7	15.8	189 28.7	51 21 23.0	- 64
23 23	307 35.3	168 10.2	57.0	162 46.4	14.6	171 30.5	20.9	84 19.1	15.9	203 52.8	51 21 16.6	- 66
15 0	322 37.7	183 09.6	+16 56.1	177 47.3	+15 14.1	186 32.4	+17 20.8	99 21.4	-14 15.9	218 16.9	52 +21 10.0	- 67
1 1	337 40.2	198 08.9	55.3	192 48.2	13.6	201 34.3	20.6	114 23.8	16.0	232 41.1	52 21 03.3	- 68
2 2	352 42.6	213 08.3	54.4	207 49.1	13.1	216 36.2	20.5	129 26.2	16.0	247 05.3	53 20 56.5	- 70
3 3	7 45.1	228 07.7	.. 53.5	222 50.0	.. 12.5	231 38.1	.. 20.3	144 28.5	.. 16.0	261 29.6	53 -20 49.5	- 71
4 4	22 47.6	243 07.0	52.6	237 50.9	12.0	246 40.1	20.2	159 30.9	16.1	275 53.9	54 20 42.4	- 73
5 5	37 50.0	258 06.4	51.7	252 51.8	11.5	261 42.0	20.0	174 33.2	16.1	290 18.3	55 20 35.1	- 74
6 6	52 52.5	273 05.8	+16 50.8	267 52.7	+15 11.0	276 43.9	+17 19.9	189 35.6	-14 16.2	304 42.8	56 +20 27.7	- 75
7 7	67 55.0	288 05.2	50.0	282 53.6	10.5	291 45.8	19.7	204 38.0	16.2	319 07.4	56 20 20.2	- 77
8 8	82 57.4	303 04.5	49.1	297 54.5	09.9	306 47.7	19.6	219 40.3	16.2	333 32.0	56 20 12.5	- 78
9 9	97 59.9	318 03.9	.. 48.2	312 55.4	.. 09.4	321 49.6	.. 19.4	234 42.7	.. 16.3	347 56.6	58 -20 04.7	- 79
10 10	113 02.4	333 03.3	47.3	327 56.3	08.9	336 51.5	19.3	249 45.0	16.3	2 21.4	58 19 56.8	- 81
11 11	128 04.8	348 02.7	46.4	342 57.2	08.4	351 53.5	19.1	264 47.4	16.4	16 46.2	58 19 48.7	- 82
12 12	143 07.3	3 02.0	+16 45.5	357 58.1	+15 07.9	6 55.4	+17 18.9	279 49.8	-14 16.4	31 11.0	60 +19 40.5	- 83
13 13	158 09.7	18 01.4	44.6	12 59.0	07.3	21 57.3	18.8	294 52.1	16.4	45 36.0	60 19 32.2	- 85
14 14	173 12.2	33 00.8	43.8	27 59.9	06.8	36 59.2	18.6	309 54.5	16.5	60 01.0	61 19 23.7	- 86
15 15	188 14.7	48 00.2	.. 42.9	43 00.8	.. 06.3	52 01.1	.. 18.5	324 56.9	.. 16.5	74 26.1	61 -19 15.1	- 87
16 16	203 17.1	62 59.5	42.0	58 01.8	05.8	67 03.0	18.3	339 59.2	16.6	88 51.2	63 19 06.4	- 88
17 17	218 19.6	77 58.9	41.1	73 02.7	05.3	82 04.9	18.2	355 01.6	16.6	103 16.5	63 18 57.6	- 89
18 18	233 22.1	92 58.3	+16 40.2	88 03.6	+15 04.7	97 06.8	+17 18.0	10 03.9	-14 16.7	117 41.8	64 +18 48.7	- 91
19 19	248 24.5	107 57.7	39.3	103 04.5	04.2	112 08.8	17.9	25 06.3	16.7	132 07.2	64 18 39.6	- 92
20 20	263 27.0	122 57.0	38.4	118 05.4	03.7	127 10.7	17.7	40 08.7	16.7	146 32.6	65 18 30.4	- 93
21 21	278 29.5	137 56.4	.. 37.5	133 06.3	.. 03.2	142 12.6	.. 17.6	55 11.0	.. 16.8	160 58.1	66 -18 21.1	- 94
22 22	293 31.9	152 55.8	36.6	148 07.2	02.6	157 14.5	17.4	70 13.4	16.8	175 23.7	67 18 11.7	- 96
23 23	308 34.4	167 55.2	35.7	163 08.1	02.1	172 16.4	17.3	85 15.7	16.9	189 49.4	68 18 02.1	- 96
16 0	323 36.9	182 54.6	+16 34.8	178 09.0	+15 01.6	187 18.3	+17 17.1	100 18.1	-14 16.9	204 15.2	68 +17 52.5	- 98
1 1	338 39.3	197 53.9	33.9	193 09.9	01.1	202 20.2	16.9	115 20.4	16.9	218 41.0	69 17 42.7	- 98
2 2	353 41.8	212 53.3	33.0	208 10.8	00.6	217 22.2	16.8	130 22.8	17.0	233 06.9	70 17 32.9	-100
3 3	8 44.2	227 52.7	.. 32.1	223 11.7	.. 15 00.0	232 24.1	.. 16.6	145 25.2	.. 17.0	247 32.9	71 -17 22.9	-101
4 4	23 46.7	242 52.1	31.2	238 12.6	14 59.5	247 26.0	16.5	160 27.5	17.1	261 59.0	71 17 12.8	-102
5 5	38 49.2	257 51.5	30.3	253 13.5	59.0	262 27.9	16.3	175 29.9	17.1	276 25.1	73 17 02.6	-103
6 6	53 51.6	272 50.8	+16 29.4	268 14.5	+14 58.5	277 29.8	+17 16.2	190 32.2	-14 17.2	290 51.4	73 +16 52.3	-104
7 7	68 54.1	287 50.2	28.5	283 15.4	57.9	292 31.7	16.0	205 34.6	17.2	305 17.7	73 16 41.9	-105
8 8	83 56.6	302 49.6	27.6	298 16.3	57.4	307 33.6	15.9	220 37.0	17.2	319 44.0	75 16 31.4	-106
9 9	98 59.0	317 49.0	.. 26.7	313 17.2	.. 56.9	322 35.5	.. 15.7	235 39.3	.. 17.3	334 10.5	75 -16 20.8	-107
10 10	114 01.5	332 48.4	25.8	328 18.1	56.4	337 37.5	15.6	250 41.7	17.3	348 37.0	77 16 10.1	-107
11 11	129 04.0	347 47.8	24.9	343 19.0	55.8	352 39.4	15.4	265 44.0	17.4	3 03.7	77 15 59.4	-109
12 12	144 06.4	2 47.2	+16 24.0	358 19.9	+14 55.3	7 41.3	+17 15.3	280 46.4	-14 17.4	17 30.4	78 +15 48.5	-110
13 13	159 08.9	17 46.5	23.1	13 20.8	54.8	22 43.2	15.1	295 48.7	17.5	31 57.2	78 15 37.5	-110
14 14	174 11.4	32 45.9	22.2	28 21.7	54.3	37 45.1	14.9	310 51.1	17.5	46 24.0	80 15 26.5	-112
15 15	189 13.8	47 45.3	.. 21.2	43 22.6	.. 53.7	52 47.0	.. 14.8	325 53.5	.. 17.5	60 51.0	80 -15 15.3	-112
16 16	204 16.3	62 44.7	20.3	58 23.5	53.2	67 48.9	14.6	340 55.8	17.6	75 18.0	81 15 04.1	-114
17 17	219 18.7	77 44.1	19.4	73 24.5	52.7	82 50.9	14.5	355 58.2	17.6	89 45.1	82 14 52.7	-114
18 18	234 21.2	92 43.5	+16 18.5	88 25.4	+14 52.2	97 52.8	+17 14.3	11 00.5	-14 17.7	104 12.3	82 +14 41.3	-115
19 19	249 23.7	107 42.9	17.6	103 26.3	51.6	112 54.7	14.2	26 02.9	17.7	118 39.5	84 14 29.8	-115
20 20	264 26.1	122 42.3	16.7	118 27.2	51.1	127 56.6	14.0	41 05.2	17.7	133 06.9	84 14 18.3	-117
21 21	279 28.6	137 41.6	.. 15.8	133 28.1	.. 50.6	142 58.5	.. 13.9	56 07.6	.. 17.8	147 34.3	85 -14 06.6	-117
22 22	294 31.1	152 41.0	14.9	148 29.0	50.1	158 00.4	13.7	71 09.9	17.8	162 01.8	86 13 51	

G M T	VENUS - 3.5		MARS 2.0		JUPITER - 1.3		SATURN 0.8		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
17 0	324 36.0	182 39.8 +16 13.0	178 30.8 +14 49.0	188 04.3 +17 13.4	101 14.7 -14 17.9	190 57.0 87 +13 31.2 -119						
1	339 38.5	197 39.2 12.1	193 31.7 48.5	203 06.2 13.2	116 17.0 18.0	205 24.7 89 13 19.3 -121						
2	354 40.9	212 38.6 11.2	208 32.7 48.0	218 08.1 13.1	131 19.4 18.0	219 52.6 88 13 07.2 -120						
3	9 43.4	227 38.0 .. 10.3	223 33.6 .. 47.4	233 10.0 .. 12.9	146 21.7 .. 18.0	234 20.4 90 12 55.2 -122						
4	24 45.9	242 37.4 09.3	238 34.5 46.9	248 11.9 12.8	161 24.1 18.1	248 48.4 90 12 43.0 -122						
5	39 48.3	257 36.8 08.4	253 35.4 46.4	263 13.8 12.6	176 26.4 18.1	263 16.4 92 12 30.8 -123						
6	54 50.8	272 36.2 +16 07.5	268 36.3 +14 45.8	278 15.8 +17 12.5	191 28.8 -14 18.2	277 44.6 92 +12 18.5 -124						
7	69 53.2	287 35.6 06.6	283 37.2 45.3	293 17.7 12.3	206 31.1 18.2	292 12.8 92 12 06.1 -124						
8	84 55.7	302 35.0 05.7	298 38.1 44.8	308 19.6 12.2	221 33.5 18.3	306 41.0 94 11 53.7 -125						
9	99 58.2	317 34.4 .. 04.7	313 39.0 .. 44.3	323 21.5 .. 12.0	236 35.8 .. 18.3	321 09.4 94 11 41.2 -125						
10	115 00.6	332 33.7 03.8	328 39.9 43.7	338 23.4 11.9	251 38.2 18.4	335 37.8 95 11 28.7 -126						
11	130 03.1	347 33.1 02.9	343 40.9 43.2	353 25.3 11.7	266 40.6 18.4	350 06.3 96 11 16.1 -126						
12	145 05.6	2 32.5 +16 02.0	358 41.8 +14 42.7	8 27.2 +17 11.6	281 42.9 -14 18.4	4 34.9 96 +11 03.5 -127						
13	160 08.0	17 31.9 01.0	13 42.7 42.1	23 29.2 11.4	296 45.3 18.5	19 03.5 97 10 50.8 -128						
14	175 10.5	32 31.3 16 00.1	28 43.6 41.6	38 31.1 11.2	311 47.6 18.5	33 32.2 98 10 38.0 -128						
15	190 13.0	47 30.7 -15 59.2	43 44.5 .. 41.1	53 33.0 .. 11.1	326 50.0 .. 18.6	48 01.0 99 10 25.2 -128						
16	205 15.4	62 30.1 58.2	58 45.4 40.6	68 34.9 10.9	341 52.3 18.6	62 29.9 99 10 12.4 -129						
17	220 17.9	77 29.5 57.3	73 46.3 40.0	83 36.8 10.8	356 54.7 18.7	76 58.8 100 9 59.5 -129						
18	235 20.3	92 28.9 +15 56.4	88 47.2 +14 39.5	98 38.7 +17 10.6	11 57.0 -14 18.7	91 27.8 101 + 9 46.6 -130						
19	250 22.8	107 28.3 55.5	103 48.2 39.0	113 40.6 10.5	26 59.4 18.7	105 56.9 101 9 33.6 -130						
20	265 25.3	122 27.7 54.5	118 49.1 38.4	128 42.6 10.3	42 01.7 18.8	120 26.0 102 9 20.6 -131						
21	280 27.7	137 27.1 .. 53.6	133 50.0 .. 37.9	143 44.5 .. 10.2	57 04.1 .. 18.8	134 55.2 103 9 07.5 -131						
22	295 30.2	152 26.5 52.7	148 50.9 37.4	158 46.4 10.0	72 06.4 18.9	149 24.5 103 8 54.4 -131						
23	310 32.7	167 25.9 51.7	163 51.8 36.8	173 48.3 09.9	87 08.8 18.9	163 53.8 104 8 41.3 -132						
18 0	325 35.1	182 25.3 +15 50.8	178 52.7 +14 36.3	188 50.2 +17 09.7	102 11.1 -14 19.0	178 23.2 105 + 8 28.1 -132						
1	340 37.6	197 24.7 49.9	193 53.6 35.8	203 52.1 09.5	117 13.5 19.0	192 52.7 105 8 14.9 -133						
2	355 40.1	212 24.1 48.9	208 54.6 35.3	218 54.1 09.4	132 15.8 19.0	207 22.2 106 8 01.6 -132						
3	10 42.5	227 23.5 .. 48.0	223 55.5 .. 34.7	233 56.0 .. 09.2	147 18.2 .. 19.1	221 51.8 107 7 48.4 -134						
4	25 45.0	242 22.9 47.0	238 56.4 34.2	248 57.9 09.1	162 20.5 19.1	236 21.5 107 7 35.0 -133						
5	40 47.5	257 22.3 46.1	253 57.3 33.7	263 59.8 08.9	177 22.9 19.2	250 51.2 108 7 21.7 -133						
6	55 49.9	272 21.7 +15 45.2	268 58.2 +14 33.1	279 01.7 +17 08.8	192 25.2 -14 19.2	265 21.0 109 + 7 08.4 -134						
7	70 52.4	287 21.2 44.2	283 59.1 32.6	294 03.6 08.6	207 27.6 19.3	279 50.9 109 6 55.0 -134						
8	85 54.8	302 20.6 43.3	299 00.0 32.1	309 05.5 08.5	222 29.9 19.3	294 20.8 110 6 41.6 -135						
9	100 57.3	317 20.0 .. 42.3	314 01.0 .. 31.5	324 07.5 .. 08.3	237 32.3 .. 19.4	308 50.8 110 6 28.1 -134						
10	115 59.8	332 19.4 41.4	329 01.9 31.0	339 09.4 08.2	252 34.6 19.4	323 20.8 111 6 14.7 -135						
11	131 02.2	347 18.8 40.4	344 02.8 30.5	354 11.3 08.0	267 37.0 19.4	337 50.9 112 6 01.2 -135						
12	146 04.7	2 18.2 +15 39.5	359 03.7 +14 29.9	9 13.2 +17 07.8	282 39.3 -14 19.5	352 21.1 112 + 5 47.7 -135						
13	161 07.2	17 17.6 38.6	14 04.6 29.4	24 15.1 07.7	297 41.7 19.5	6 51.3 112 5 34.2 -135						
14	176 09.6	32 17.0 37.6	29 05.5 28.9	39 17.0 07.5	312 44.0 19.6	21 21.5 113 5 20.7 -136						
15	191 12.1	47 16.4 .. 36.7	44 06.4 .. 28.3	54 19.0 .. 07.4	327 46.4 .. 19.6	35 51.8 114 5 07.1 -135						
16	206 14.6	62 15.8 35.7	59 07.4 27.8	69 20.9 07.2	342 48.7 19.7	50 22.2 114 4 53.6 -136						
17	221 17.0	77 15.2 34.8	74 08.3 27.3	84 22.8 07.1	357 51.1 19.7	64 52.6 115 4 40.0 -136						
18	236 19.5	92 14.6 +15 33.8	89 09.2 +14 26.7	99 24.7 +17 06.9	12 53.4 -14 19.8	79 23.1 115 + 4 26.4 -136						
19	251 21.9	107 14.0 32.9	104 10.1 26.2	114 26.6 06.8	27 55.8 19.8	93 53.6 116 4 12.8 -136						
20	266 24.4	122 13.5 31.9	119 11.0 25.7	129 28.5 06.6	42 58.1 19.8	108 24.2 117 3 59.2 -136						
21	281 26.9	137 12.9 .. 31.0	134 11.9 .. 25.1	144 30.5 .. 06.4	58 00.5 .. 19.9	122 54.9 116 3 45.6 -136						
22	296 29.3	152 12.3 30.0	149 12.9 24.6	159 32.4 06.3	73 02.8 19.9	137 25.5 118 3 32.0 -136						
23	311 31.8	167 11.7 29.1	164 13.8 24.1	174 34.3 06.1	88 05.2 20.0	151 56.3 118 3 18.4 -136						
19 0	326 34.3	182 11.1 +15 28.1	179 14.7 +14 23.5	189 36.2 +17 06.0	103 07.5 -14 20.0	166 27.1 118 + 3 04.8 -136						
1	341 36.7	197 10.5 27.2	194 15.6 23.0	204 38.1 05.8	118 09.9 20.1	180 57.9 118 2 51.2 -136						
2	356 39.2	212 09.9 26.2	209 16.5 22.5	219 40.0 05.7	133 12.2 20.1	195 28.7 120 2 37.6 -136						
3	11 41.7	227 09.3 .. 25.2	224 17.4 .. 21.9	234 42.0 .. 05.5	148 14.6 .. 20.2	209 59.7 119 2 24.0 -136						
4	26 44.1	242 08.8 24.3	239 18.4 21.4	249 43.9 05.4	163 16.9 20.2	224 30.6 120 2 10.4 -136						
5	41 46.6	257 08.2 23.3	254 19.3 20.9	264 45.8 05.2	178 19.3 20.2	239 01.6 121 1 56.8 -136						
6	56 49.1	272 07.6 +15 22.4	269 20.2 +14 20.3	279 47.7 +17 05.1	193 21.6 -14 20.3	253 32.7 121 + 1 43.2 -136						
7	71 51.5	287 07.0 21.4	284 21.1 19.8	294 49.6 04.9	208 24.0 20.3	268 03.8 121 1 29.6 -136						
8	86 54.0	302 06.4 20.5	299 22.0 19.3	309 51.5 04.7	223 26.3 20.4	282 34.9 122 1 16.0 -135						
9	101 56.4	317 05.8 .. 19.5	314 22.9 .. 18.7	324 53.5 .. 04.6	238 28.6 .. 20.4	297 06.1 122 1 02.5 -136						
10	116 58.9	332 05.3 18.5	329 23.9 18.2	339 55.4 04.4	253 31.0 20.5	311 37.3 122 0 48.9 -136						
11	132 01.4	347 04.7 17.6	344 24.8 17.6	354 57.3 04.3	268 33.3 20.5	326 08.5 123 0 35.4 -136						
12	147 03.8	2 04.1 +15 16.6	359 25.7 +14 17.1	9 59.2 +17 04.1	283 35.7 -14 20.6	340 39.8 123 + 0 21.8 -135						
13	162 06.3	17 03.5 15.6	14 26.6 16.6	25 01.1 04.0	298 38.0 20.6	355 11.1 124 + 0 08.3 -135						
14	177 08.8	32 02.9 14.7	29 27.5 16.0	40 03.0 03.8	313 40.4 20.7	9 42.5 124 - 0 05.2 -135						
15	192 11.2	47 02.3 .. 13.7	44 28.5 .. 15.5	55 05.0 .. 03.7	328 42.7 .. 20.7	24 13.9 124 0 18.7 -135						
16	207 13.7	62 01.8 12.8	59 29.4 15.0	70 06.9 03.5	343 45.1 20.7	38 45.3 125 0 32.2 -134						
17	222 16.2	77 01.2 11.8	74 30.3 14.4	85 08.8 03.3	358 47.4 20.8	53 16.8 125 0 45.6 -134						
18	237 18.6	92 00.6 +15 10.8	89 31.2 +14 13.9	100 10.7 +17 03.2	13 49.8 -14 20.8	67 48.3 125 - 0 59.0 -135						
19	252 21.1	107 00.0 09.9	104 32.1 13.4	115 12.6 03.0	28 52.1 20.9	82 19.8 125 1 12.5 -134						
20	267 23.6	121 59.4 08.9	119 33.1 12.8	130 14.6 02.9	43 54.4 20.9	96 51.3 126 1 25.9 -133						
21	282 26.0	136 58.9 .. 07.9	134 34.0 .. 12.3	145 16.5 .. 02.7	58 56.8 .. 21.0	111 22.9 126 1 39.2 -134						
22	297 28.5	151 58.3 06.9	149 34.9 11.7	160 18.4 02.6	73 59.1 21.0	125 54.5 127 1 52.6 -133						
23	312 30.9	166 57.7 06.0	164 35.8 11.2	175 20.3 02.4	89 01.5 21.1	140 26.2 126 2 05.9 -133						
24	327 33.4	181 57.1 +15 05.0	179 36.7 +14 10.7	190 22.2 +17 02.3	104 03.8 -14 21.1	154 57.8 127 - 2 19.2 -133						
code	-	- 6 - 9	+ 9 - 5	+ 19 - 1	+ 24	■						

G M T	SUN				STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA		Dec.		No.	Name	SHA	Dec.				17	18	19	20	Alt.	Sun's Low'r Limb	Venus	Mars		
	h	m	°	'				°	'	°	'									h	m
17	0	178	56.5	+13 44.8	7	Acamar	315 51.1	-40 28.5	72	2 39	////	2 22	4 44	6 51	8 52						
	1	193	56.6		5	Achernar	335 58.6	-57 27.3	70	3 08	////	2 48	4 55	6 53	8 45						
	2	208	56.7		30	Acruv	173 58.4	-62 51.5	68	3 29	////	3 07	5 04	6 54	8 40						
	3	223	56.8	.. 42.4	19	Adhara	255 46.9	-28 54.5	66	3 45	////	3 22	5 11	6 55	8 36						
	4	238	57.0		10	Aldebaran	291 39.2	+16 25.4	64	3 59	////	3 35	5 18	6 57	8 32	0					
	5	253	57.1						62	4 10	////	3 45	5 23	6 58	8 29	30	0.1	0.1	0.1		
	6	268	57.2	+13 40.0	32	Alioth	166 58.9	+56 12.2	60	4 19	////	3 54	5 28	6 59	8 26	45	0.1	0.1	0.0		
	7	283	57.4		34	Alkaid	153 33.1	+49 32.2	58	4 28	0 47	4 02	5 32	6 59	8 24	60	0.1	0.1	0.0		
	8	298	57.5		55	Al Na'ir	28 37.5	-47 10.4	56	4 35	1 34	4 08	5 36	7 00	8 22	75	0.1	0.0	0.0		
	9	313	57.6	.. 37.7	15	Alnilam	276 30.5	- 1 13.6	54	4 42	2 02	4 14	5 39	7 01	8 20	90	0.1	0.0	0.0		
	10	328	57.7		25	Alphard	218 39.0	- 8 27.9	52	4 48	2 22	4 20	5 42	7 01	8 18						
	11	343	57.9						50	4 53	2 38	4 25	5 44	7 02	8 16						
	12	358	58.0	+13 35.3	41	Alphecca	126 47.7	+26 52.0	45	5 04	3 09	4 35	5 50	7 03	8 13	Moon's Lower Limb					
	13	13	58.1		1	Alpheratz	358 28.1	+28 50.9	40	5 14	3 32	4 44	5 55	7 04	8 10	Add					
	14	28	58.3		51	Altair	62 50.2	+ 8 45.2	35	5 22	3 49	4 52	5 59	7 05	8 08	Alt.	17	18	19		
	15	43	58.4	.. 32.9	2	Ankaa	353 58.0	-42 32.5	30	5 29	4 02	4 58	6 03	7 05	8 05	0					
	16	58	58.5		42	Antares	113 19.3	-26 20.2	20	5 41	4 23	5 09	6 09	7 06	8 02	4	18.3	17.6	16.7		
	17	73	58.6		31.3				10	5 51	4 39	5 19	6 15	7 08	7 59	8	18.3	17.6	16.7		
	18	88	58.8	+13 30.5	37	Arcturus	146 35.3	+19 24.9	0	6 01	4 50	5 29	6 20	7 09	7 56	12	18.3	17.5	16.7		
	19	103	58.9		43	Atria	108 59.9	-68 57.2	10	6 10	5 00	5 38	6 25	7 10	7 53	16	18.2	17.5	16.7		
	20	118	59.0		22	Avior	234 36.4	-59 21.9	20	6 20	5 07	5 48	6 31	7 11	7 50	20	18.2	17.5	16.6		
	21	133	59.2	.. 28.1	13	Bellatrix	279 18.6	+ 6 18.7	30	6 31	5 11	5 59	6 37	7 12	7 46	24	18.1	17.4	16.6		
	22	148	59.3		16	Betelge'se	271 48.4	+ 7 24.1	35	6 38	5 14	6 05	6 40	7 13	7 44	28	18.1	17.4	16.6		
	23	163	59.4						40	6 45	5 16	6 12	6 44	7 14	7 42	32	18.0	17.3	16.5		
					17	Canopus	264 15.8	-52 40.0	45	6 54	5 16	6 21	6 49	7 15	7 39	36	17.9	17.2	16.5		
					12	Capella	281 38.7	+45 57.2	50	7 04	5 17	6 31	6 55	7 16	7 36	40	17.8	17.2	16.5		
					53	Deneb	50 00.6	+45 07.5	52	7 09	5 17	6 36	6 57	7 17	7 35	44	17.7	17.1	16.4		
					28	Denebola	183 18.0	+14 49.2	54	7 14	5 16	6 41	7 00	7 17	7 33	48	17.6	17.0	16.4		
					4	Diphda	349 39.1	-18 13.5	56	7 20	5 16	6 46	7 03	7 18	7 32	52	17.4	16.9	16.3		
									58	7 26	5 16	6 53	7 07	7 19	7 30	56	17.3	16.8	16.3		
					27	Dubhe	194 45.2	+61 59.5	60	7 33	5 14	7 00	7 10	7 19	7 28	60	17.2	16.7	16.2		
					14	Elnath	279 07.6	+28 34.3	S							64	17.0	16.6	16.2		
					47	Eltanin	91 06.0	+51 29.9	Lat.	Sunset	Twlt. ends	Moonset				Alt.	17	18	19		
					54	Enif	34 29.3	+ 9 40.5				17	18	19	20						
					56	Fomalhaut	16 11.3	-29 51.2	N	h	m	h	m	h	m	h	m	h	m		
					31	Gacrux	172 49.7	-56 52.1	72	21 24	////	19 58	19 34	19 14	18 53	72	16.8	16.4	16.0		
					29	Gienah	176 37.2	-17 17.8	70	20 56	////	19 44	19 29	19 16	19 02	80	16.6	16.3	16.0		
					35	Hadar	149 49.8	-60 09.9	68	20 36	////	19 33	19 25	19 17	19 10	84	16.5	16.2	15.9		
					6	Hamal	328 49.6	+23 15.3	66	20 20	////	19 23	19 21	19 19	19 16	88	16.3	16.1	15.9		
					48	Kaus Aust.	84 41.0	-34 24.5	64	20 07	////	19 16	19 18	19 20	19 21	90	16.2	16.0	15.8		
									62	19 56	////	19 09	19 15	19 21	19 26	Add to table, back cover					
					40	Kochab	137 18.1	+74 20.5	60	19 47	////	19 03	19 13	19 21	19 30	Moon's Upper Limb					
					57	Markab	14 21.2	+14 58.2	58	19 39	23 09	18 58	19 10	19 22	19 34	Subtract					
					8	Menkar	315 00.3	+ 3 55.2	56	19 31	22 27	18 53	19 09	19 23	19 37	Alt.	17	18	19		
					36	Menkent	148 58.9	-36 09.3	54	19 25	22 01	18 49	19 07	19 23	19 40	0					
					24	Miapl'dus	221 50.0	-69 32.1	52	19 19	21 41	18 45	19 05	19 24	19 43	4	14.0	14.4	14.9		
									50	19 14	21 26	18 41	19 04	19 24	19 45	8	14.0	14.4	14.9		
					9	Mirfak	309 42.4	+49 42.2	45	19 03	20 56	18 34	19 01	19 26	19 50	12	14.0	14.4	14.9		
					50	Nunki	76 51.7	-26 21.2	40	18 54	20 35	18 27	18 58	19 27	19 55	16	14.1	14.5	14.9		
					52	Peacock	54 26.8	-56 52.7	35	18 46	20 18	18 22	18 55	19 27	19 58	20	14.1	14.5	15.0		
					21	Pollux	244 21.0	+28 08.1	30	18 39	20 04	18 17	18 53	19 28	20 02	24	14.2	14.5	15.0		
					20	Procyon	245 45.3	+ 5 20.4	20	18 27	19 44	18 08	18 50	19 29	20 08	28	14.2	14.5	15.0		
									10	18 17	19 29	18 00	18 46	19 30	20 13	32	14.3	14.7	15.0		
					46	R'halague	96 46.5	+12 35.6	0	18 07	19 18	17 53	18 43	19 31	20 18	36	14.4	14.7	15.1		
					26	Regulus	208 29.9	+12 11.1	10	17 58	19 09	17 46	18 40	19 32	20 23	40	14.5	14.8	15.1		
					11	Rigel	281 53.8	- 8 14.9	20	17 48	19 02	17 38	18 37	19 33	20 28	44	14.6	14.9	15.2		
					38	Rigel Kent.	140 51.2	-60 39.5	30	17 37	18 58	17 29	18 33	19 34	20 34	48	14.7	15.0	15.2		
					44	Sabik	103 02.1	-15 40.3	35	17 31	18 56	17 24	18 31	19 35	20 37	52	14.9	15.0	15.3		
									40	17 23	18 54	17 18	18 28	19 36	20 41	56	15.0	15.1	15.3		
					3	Schedar	350 29.7	+56 17.6	45	17 15	18 54	17 11	18 25	19 37	20 46	60	15.1	15.2	15.4		
					45	Shaula	97 20.5	-37 04.5	50	17 05	18 54	17 03	18 21	19 37	20 51	64	15.3	15.3	15.4		
					18	Sirius	259 12.1	-16 39.1	52	17 00	18 54	16 59	18 20	19 38	20 54	68	15.4	15.4	15.5		
					33	Spica	159 17.1	-10 55.9	54	16 55	18 55	16 55	18 18	19 38	20 56	72	15.5	15.5	15.5		
					23	Suhail	223 24.8	-43 15.1	56	16 49	18 55	16 50	18 16	19 39	21 00	76	15.7	15.7	15.6		
									58	16 43	18 56	16 44	18 14	19 40	21 03	80	15.8	15.8	15.7		
					49	Vega	81 08.0	+38 44.7	60	16 36	18 58	16 38	18 11	19 40	21 07	84	16.0	15.9	15.7		
					39	Zub'g'bi	137 53.5	-15 51.6	S							88	16.1	16.0	15.8		
					Equation of Time (App.—Mean)				GMT of Transit Meridian of Greenwich								Subtract from table, back cover				
					17		18		19												
					h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m
					0	-	4 14.4	-	4 02.0	-	3 49.1										
					6	-	4 11.3	-	3 58.8	-	3 45.8	17	11 41	11 50	12 05	11 26	17 12				
					12	-	4 08.3	-	3 55.6	-	3 42.5	18</									

Moon's Lower Limb

Add

Alt. 17 18 19

0 18.3 17.6 16.7

4 18.3 17.6 16.7

8 18.3 17.6 16.7

12 18.3 17.6 16.7

16 18.2 17.5 16.6

G M T	T	VENUS - 3.5		MARS 2.0		JUPITER - 1.3		SATURN 0.8		MOON			
		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
20	0	327 33.4	181 57.1	+15 05.0	179 36.7	+14 10.7	190 22.2	+17 02.3	104 03.8	-14 21.1	154 57.8	127 - 2	19.2 -133
	1	342 35.9	196 56.6	04.0	194 37.6	10.1	205 24.1	02.1	119 06.2	21.2	169 29.5	128	2 32.5 -132
	2	357 38.3	211 56.0	03.1	209 38.6	09.6	220 26.1	02.0	134 08.5	21.2	184 01.3	127	2 45.7 -132
	3	12 40.8	226 55.4	.. 02.1	224 39.5	.. 09.1	235 28.0	.. 01.8	149 10.9	.. 21.2	198 33.0	128	2 58.9 -132
	4	27 43.3	241 54.8	01.1	239 40.4	08.5	250 29.9	01.6	164 13.2	21.3	213 04.8	128	3 12.1 -131
	5	42 45.7	256 54.3	15 00.1	254 41.3	08.0	265 31.8	01.5	179 15.5	21.3	227 36.6	128	3 25.2 -132
	6	57 48.2	271 53.7	+14 59.2	269 42.2	+14 07.4	280 33.7	+17 01.3	194 17.9	-14 21.4	242 08.4	128	- 3 38.4 -130
	7	72 50.7	286 53.1	58.2	284 43.2	06.9	295 35.6	01.2	209 20.2	21.4	256 40.2	129	3 51.4 -131
	8	87 53.1	301 52.5	57.2	299 44.1	06.4	310 37.6	01.0	224 22.6	21.5	271 12.1	129	4 04.5 -130
	9	102 55.6	316 52.0	.. 56.2	314 45.0	.. 05.8	325 39.5	.. 00.9	239 24.9	.. 21.5	285 44.0	129	4 17.5 -130
	10	117 58.0	331 51.4	55.3	329 45.9	05.3	340 41.4	00.7	254 27.3	21.6	300 15.9	129	4 30.5 -129
	11	133 00.5	346 50.8	54.3	344 46.9	04.7	355 43.3	00.6	269 29.6	21.6	314 47.8	129	4 43.4 -129
	12	148 03.0	1 50.3	+14 53.3	359 47.8	+14 04.2	10 45.2	+17 00.4	284 31.9	-14 21.7	329 19.7	130	- 4 56.3 -129
	13	163 05.4	16 49.7	52.3	14 48.7	03.7	25 47.2	00.2	299 34.3	21.7	343 51.7	129	5 09.2 -128
	14	178 07.9	31 49.1	51.3	29 49.6	03.1	40 49.1	17 00.1	314 36.6	21.8	358 23.6	130	5 22.0 -128
	15	193 10.4	46 48.5	.. 50.4	44 50.5	.. 02.6	55 51.0	-16 59.9	329 39.0	.. 21.8	12 55.6	130	5 34.8 -127
	16	208 12.8	61 48.0	49.4	59 51.5	02.0	70 52.9	59.8	344 41.3	21.8	27 27.6	130	5 47.5 -127
	17	223 15.3	76 47.4	48.4	74 52.4	01.5	85 54.8	59.6	359 43.6	21.9	41 59.6	130	6 00.2 -127
	18	238 17.8	91 46.8	+14 47.4	89 53.3	+14 01.0	100 56.7	+16 59.5	14 46.0	-14 21.9	56 31.6	131	- 6 12.9 -126
	19	253 20.2	106 46.3	46.4	104 54.2	14 00.4	115 58.7	59.3	29 48.3	22.0	71 03.7	130	6 25.5 -126
	20	268 22.7	121 45.7	45.4	119 55.1	13 59.9	131 00.6	59.2	44 50.7	22.0	85 35.7	131	6 38.1 -125
	21	283 25.2	136 45.1	.. 44.4	134 56.1	.. 59.3	146 02.5	.. 59.0	59 53.0	.. 22.1	100 07.8	130	6 50.6 -125
	22	298 27.6	151 44.6	43.5	149 57.0	58.8	161 04.4	58.8	74 55.4	22.1	114 39.8	131	7 03.1 -124
	23	313 30.1	166 44.0	42.5	164 57.9	58.2	176 06.3	58.7	89 57.7	22.2	129 11.9	131	7 15.5 -124
21	0	328 32.5	181 43.4	+14 41.5	179 58.8	+13 57.7	191 08.3	+16 58.5	105 00.0	-14 22.2	143 44.0	131	- 7 27.9 -123
	1	343 35.0	196 42.9	40.5	194 59.8	57.2	206 10.2	58.4	120 02.4	22.3	158 16.1	131	7 40.2 -123
	2	358 37.5	211 42.3	39.5	210 00.7	56.6	221 12.1	58.2	135 04.7	22.3	172 48.2	131	7 52.5 -122
	3	13 39.9	226 41.7	.. 38.5	225 01.6	.. 56.1	236 14.0	.. 58.1	150 07.1	.. 22.4	187 20.3	131	8 04.7 -121
	4	28 42.4	241 41.2	37.5	240 02.5	55.5	251 15.9	57.9	165 09.4	22.4	201 52.4	131	8 16.8 -122
	5	43 44.9	256 40.6	36.5	255 03.5	55.0	266 17.9	57.8	180 11.7	22.5	216 24.5	131	8 29.0 -120
	6	58 47.3	271 40.0	+14 35.5	270 04.4	+13 54.5	281 19.8	+16 57.6	195 14.1	-14 22.5	230 56.6	131	- 8 41.0 -120
	7	73 49.8	286 39.5	34.5	285 05.3	53.9	296 21.7	57.4	210 16.4	22.5	245 28.7	132	8 53.0 -120
	8	88 52.3	301 38.9	33.6	300 06.2	53.4	311 23.6	57.3	225 18.8	22.6	260 00.9	131	9 05.0 -119
	9	103 54.7	316 38.4	.. 32.6	315 07.1	.. 52.8	326 25.5	.. 57.1	240 21.1	.. 22.6	274 33.0	131	9 16.9 -118
	10	118 57.2	331 37.8	31.6	330 08.1	52.3	341 27.5	57.0	255 23.4	22.7	289 05.1	131	9 28.7 -118
	11	133 59.7	346 37.2	30.6	345 09.0	51.7	356 29.4	56.8	270 25.8	22.7	303 37.2	132	9 40.5 -117
	12	149 02.1	1 36.7	+14 29.6	0 09.9	+13 51.2	11 31.3	+16 56.7	285 28.1	-14 22.8	318 09.4	131	- 9 52.2 -117
	13	164 04.6	16 36.1	28.6	15 10.8	50.7	26 33.2	56.5	300 30.4	22.8	332 41.5	131	10 03.9 -116
	14	179 07.0	31 35.6	27.6	30 11.8	50.1	41 35.1	56.4	315 32.8	22.9	347 13.6	131	10 15.5 -116
	15	194 09.5	46 35.0	.. 26.6	45 12.7	.. 49.6	56 37.1	.. 56.2	330 35.1	.. 22.9	1 45.7	132	10 27.1 -115
	16	209 12.0	61 34.4	25.6	60 13.6	49.0	71 39.0	56.0	345 37.5	23.0	16 17.9	131	10 38.6 -114
	17	224 14.4	76 33.9	24.6	75 14.5	48.5	86 40.9	55.9	0 39.8	23.0	30 50.0	131	10 50.0 -113
	18	239 16.9	91 33.3	+14 23.6	90 15.5	+13 47.9	101 42.8	+16 55.7	15 42.1	-14 23.1	45 22.1	131	-11 01.3 -113
	19	254 19.4	106 32.8	22.6	105 16.4	47.4	116 44.7	55.6	30 44.5	23.1	59 54.2	131	11 12.6 -113
	20	269 21.8	121 32.2	21.6	120 17.3	46.8	131 46.6	55.4	45 46.8	23.2	74 26.3	131	11 23.9 -111
	21	284 24.3	136 31.7	.. 20.6	135 18.2	.. 46.3	146 48.6	.. 55.3	60 49.1	.. 23.2	88 58.4	131	11 35.0 -111
	22	299 26.8	151 31.1	19.6	150 19.2	45.8	161 50.5	55.1	75 51.5	23.3	103 30.5	131	11 46.1 -111
	23	314 29.2	166 30.5	18.6	165 20.1	45.2	176 52.4	55.0	90 53.8	23.3	118 02.6	131	11 57.2 -109
22	0	329 31.7	181 30.0	+14 17.6	180 21.0	+13 44.7	191 54.3	+16 54.8	105 56.2	-14 23.4	132 34.7	130	-12 08.1 -109
	1	344 34.1	196 29.4	16.6	195 21.9	44.1	206 56.3	54.6	120 58.5	23.4	147 06.7	131	12 19.0 -109
	2	359 36.6	211 28.9	15.5	210 22.9	43.6	221 58.2	54.5	136 00.8	23.4	161 38.8	131	12 29.9 -107
	3	14 39.1	226 28.3	.. 14.5	225 23.8	.. 43.0	237 00.1	.. 54.3	151 03.2	.. 23.5	176 10.9	130	12 40.6 -107
	4	29 41.5	241 27.8	13.5	240 24.7	42.5	252 02.0	54.2	166 05.5	23.5	190 42.9	130	12 51.3 -107
	5	44 44.0	256 27.2	12.5	255 25.6	41.9	267 03.9	54.0	181 07.8	23.6	205 14.9	131	13 02.0 -105
	6	59 46.5	271 26.7	+14 11.5	270 26.6	+13 41.4	282 05.9	+16 53.9	196 10.2	-14 23.6	219 47.0	130	-13 12.5 -105
	7	74 48.9	286 26.1	10.5	285 27.5	40.8	297 07.8	53.7	211 12.5	23.7	234 19.0	130	13 23.0 -104
	8	89 51.4	301 25.6	09.5	300 28.4	40.3	312 09.7	53.6	226 14.8	23.7	248 51.0	130	13 33.4 -103
	9	104 53.9	316 25.0	.. 08.5	315 29.3	.. 39.7	327 11.6	.. 53.4	241 17.2	.. 23.8	263 23.0	130	13 43.7 -103
	10	119 56.3	331 24.5	07.5	330 30.3	39.2	342 13.5	53.2	256 19.5	23.8	277 55.0	129	13 54.0 -102
	11	134 58.8	346 23.9	06.5	345 31.2	38.7	357 15.5	53.1	271 21.9	23.9	292 26.9	130	14 04.2 -101
	12	150 01.3	1 23.4	+14 05.4	0 32.1	+13 38.1	12 17.4	+16 52.9	286 24.2	-14 23.9	306 58.9	129	-14 14.3 -101
	13	165 03.7	16 22.8	04.4	15 33.1	37.6	27 19.3	52.8	301 26.5	24.0	321 30.8	129	14 24.4 - 99
	14	180 06.2	31 22.3	03.4	30 34.0	37.0	42 21.2	52.6	316 28.9	24.0	336 02.7	129	14 34.3 - 99
	15	195 08.6	46 21.7	.. 02.4	45 34.9	.. 36.5	57 23.1	.. 52.5	331 31.2	.. 24.1	350 34.6	129	-14 44.2 - 98
	16	210 11.1	61 21.2	01.4	60 35.8	35.9	72 25.1	52.3	346 33.5	24.1	5 06.5	129	14 54.0 - 97
	17	225 13.6	76 20.6	14 00.4	75 36.8	35.4	87 27.0	52.2	1 35.9	24.2	19 38.4	129	15 03.7 - 97
	18	240 16.0	91 20.1	+13 59.4	90 37.7	+13 34.8	102 28.9	+16 52.0	16 38.2	-14 24.2	34 10.3	128	-15 13.4 - 96
	19	255 18.5	106 19.5	58.3	105 38.6	34.3	117 30.8	51.8	31 40.5	24.3	48 42.1	129	15 23.0 - 95
	20	270 21.0	121 19.0	57.3	120 39.5	33.7	132 32.7	51.7	46 42.9	24.3	63 14.0	128	15 32.5 - 94
	21	285 23.4	136 18.4	.. 56.3	135 40.5	.. 33.2	147 34.7	.. 51.5	61 45.2	.. 24.4	77 45.8	128	15 41.9 - 94
	22	300 25.9	151 17.9	55.3	150 41.4	32.6	162 36.6	51.4	76 47.5	24.4	92 17.6	128	15 51.2 - 93
	23	315 28.4	166 17.3	54.3	165 42.3	32.1	177 38.5	51.2	91 49.9	24.5	106 49.4	127	16 00.5 - 91
24	0	330 30.8	181 16.8	+13 53.2	180 43.3	+13 31.5	192 40.4	+16 51.1	106 52.2	-14 24.5	121 21.1	128	-16 09.6 - 91
code		-	- 6	- 10	+ 9	- 5	+ 19	- 2	+ 23	0			

G M T	SUN			STARS			Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS						
	GHA	Dec.	No.	Name	SHA	Dec.				20	21	22	23	Sun's Low'r Limb	Venus	Mars				
																	Add	Add	Add	Add
h	°	'	°	°	'	°	N	h	m	h	m	h	m	h	m	Alt.	°	'	°	'
20	179	06.1	+12	46.9	7	Acamar	315 51.0	-40	28.5	72	2 58	///	8 52	10 53	13 06	14 46	0	0.1	0.1	0.1
1	194	06.3		46.1	5	Achernar	335 58.5	-57	27.3	70	3 22	///	8 45	10 37	12 33	14 46	30	0.1	0.1	0.0
2	209	06.4		45.3	30	Acruz	173 58.4	-62	51.5	68	3 41	///	8 40	10 24	12 10	14 00	45	0.1	0.1	0.0
3	224	06.6	..	44.5	19	Adhara	255 46.8	-28	54.5	66	3 55	///	8 36	10 14	11 52	13 31	60	0.1	0.0	0.0
4	239	06.7		43.7	10	Aldebaran	291 39.2	+16	25.4	64	4 08	///	8 32	10 05	11 37	13 09	75	0.1	0.0	0.0
5	254	06.9		42.9						62	4 18	///	8 29	9 58	11 25	12 51	90			
6	269	07.0	+12	42.0	32	Alioth	166 58.9	+56	12.2	60	4 27	///	8 26	9 51	11 15	12 36				
7	284	07.1		41.2	34	Alkaid	153 33.1	+49	32.2	58	4 34	1 14	8 24	9 46	11 06	12 24				
8	299	07.3		40.4	55	Al Na'ir	28 37.5	-47	10.4	56	4 41	1 49	8 22	9 41	10 58	12 13				
9	314	07.4	..	39.6	15	Alnilam	276 30.5	-1	13.6	54	4 47	2 13	8 20	9 36	10 51	12 04				
10	329	07.6		38.8	25	Alphard	218 39.0	-8	27.9	52	4 52	2 31	8 18	9 32	10 45	11 56				
11	344	07.7		37.9						50	4 57	2 46	8 16	9 29	10 40	11 48				
12	359	07.9	+12	37.1	41	Alphecca	126 47.7	+26	52.0	45	5 08	3 15	8 13	9 21	10 28	11 32				
13	14	08.0		36.3	1	Alpheratz	358 28.1	+28	50.9	40	5 16	3 35	8 10	9 15	10 18	11 19				
14	29	08.2		35.5	51	Altair	62 50.2	+8	45.2	35	5 24	3 52	8 08	9 09	10 09	11 08				
15	44	08.3	..	34.7	2	Ankaa	353 58.0	-42	32.5	30	5 30	4 05	8 05	9 04	10 02	10 58				
16	59	08.4		33.8	42	Antares	113 19.4	-26	20.2	20	5 41	4 24	8 02	8 56	9 49	10 42				
17	74	08.6		33.0						10	5 51	4 39	7 59	8 48	9 38	10 28				
18	89	08.7	+12	32.2	37	Arcturus	146 35.3	+19	24.9	0	6 00	4 50	7 56	8 42	9 28	10 14				
19	104	08.9		31.4	43	Atria	109 00.0	-68	57.2	10	6 09	4 58	7 53	8 35	9 18	10 01				
20	119	09.0		30.6	22	Avior	234 36.4	-59	21.9	20	6 18	5 05	7 50	8 28	9 07	9 47				
21	134	09.2	..	29.7	13	Bellatrix	279 18.6	+6	18.8	30	6 28	5 09	7 46	8 20	8 54	9 31				
22	149	09.3		28.9	16	Betelg'se	271 48.4	+7	24.1	35	6 34	5 10	7 44	8 15	8 47	9 22				
23	164	09.5		28.1						40	6 41	5 11	7 42	8 10	8 39	9 11				
					17	Canopus	264 15.7	-52	40.0	45	6 49	5 11	7 39	8 04	8 30	8 59				
					12	Capella	281 38.7	+45	57.2	50	6 58	5 11	7 36	7 57	8 19	8 44				
					53	Deneb	50 00.6	+45	07.5	52	7 02	5 11	7 35	7 54	8 14	8 37				
					28	Denebola	183 18.0	+14	49.2	54	7 07	5 10	7 33	7 50	8 08	8 29				
					4	Diphda	349 39.0	-18	13.5	56	7 12	5 10	7 32	7 46	8 02	8 21				
										58	7 18	5 08	7 30	7 42	7 55	8 11				
					27	Dubhe	194 45.2	+61	59.5	60	7 25	5 07	7 28	7 37	7 47	8 00				
					14	El Nath	279 07.5	+28	34.3											
					47	Eltanin	91 06.0	+51	29.9											
					54	Enif	34 29.3	+9	40.5											
					56	Fomalhaut	16 11.3	-29	51.2											
					31	Gacrux	172 49.7	-56	52.1											
					29	Gienah	176 37.2	-17	17.8											
					35	Hadar	149 49.8	-60	09.9											
					6	Hamal	328 49.6	+23	15.3											
					48	Kaus Aust.	84 41.0	-34	24.5											
					40	Kochab	137 18.2	+74	20.5											
					57	Markab	14 21.2	+14	58.2											
					8	Menkar	315 00.3	+3	55.2											
					36	Menkent	148 58.9	-36	09.3											
					24	Miap'l'dus	221 50.0	-69	32.1											
					9	Mirfak	309 42.4	+49	42.2											
					50	Nunki	76 51.7	-26	21.2											
					52	Peacock	54 26.8	-56	52.7											
					21	Pollux	244 20.9	+28	08.1											
					20	Procyon	245 45.3	+5	20.4											
					46	R'alhague	96 46.5	+12	35.6											
					26	Regulus	208 29.9	+12	11.1											
					11	Rigel	281 53.8	-8	14.9											
					38	Rigel Kent	140 51.3	-60	39.5											
					44	Sabik	103 02.1	-15	40.3											
					3	Schedar	350 29.6	+56	17.7											
					45	Shaula	97 20.6	-37	04.5											
					18	Sirius	259 12.1	-16	39.1											
					33	Spica	159 17.1	-10	55.9											
					23	Suhail	223 24.8	-43	15.1											
					49	Vega	81 08.0	+38	44.8											
					39	Zub'g'bi	137 53.5	-15	51.6											

G M T	T		VENUS - 3.5				MARS 2.0				JUPITER - 1.3				SATURN 0.8				MOON			
	GHA		GHA	Dec.			GHA	Dec.			GHA	Dec.			GHA	Dec.			GHA	code	Dec.	code
23	h	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
	0	330 30.8	181 16.8	+13	53.2	180 43.3	+13	31.5	192 40.4	+16	51.1	106 52.2	-14	24.5	121 21.1	128	-16	09.6	-	91		
	1	345 33.3	196 16.2		52.2	195 44.2		31.0	207 42.4		50.9	121 54.5		24.6	135 52.9	127	16	18.7	-	90		
	2	0 35.7	211 15.7		51.2	210 45.1		30.4	222 44.3		50.7	136 56.9		24.6	150 24.6	127	16	27.7	-	90		
	3	15 38.2	226 15.2	..	50.2	225 46.0	..	29.9	237 46.2	..	50.6	151 59.2	..	24.7	164 56.3	127	16	36.7	-	88		
	4	30 40.7	241 14.6		49.2	240 47.0		29.3	252 48.1		50.4	167 01.5		24.7	179 28.0	126	16	45.5	-	88		
	5	45 43.1	256 14.1		48.1	255 47.9		28.8	267 50.0		50.3	182 03.9		24.8	193 59.6	127	16	54.3	-	86		
	6	60 45.6	271 13.5	+13	47.1	270 48.8	+13	28.2	282 52.0	+16	50.1	197 06.2	-14	24.8	208 31.3	126	-17	02.9	-	86		
	7	75 48.1	286 13.0		46.1	285 49.8		27.7	297 53.9		50.0	212 08.5		24.9	223 02.9	126	17	11.5	-	85		
	8	90 50.5	301 12.4		45.1	300 50.7		27.1	312 55.8		49.8	227 10.9		24.9	237 34.5	126	17	20.0	-	84		
	9	105 53.0	316 11.9	..	44.0	315 51.6	..	26.6	327 57.7	..	49.7	242 13.2	..	25.0	252 06.1	126	17	28.4	-	84		
	10	120 55.5	331 11.4		43.0	330 52.6		26.0	342 59.6		49.5	257 15.5		25.0	266 37.7	125	17	36.8	-	82		
	11	135 57.9	346 10.8		42.0	345 53.5		25.5	358 01.6		49.3	272 17.9		25.0	281 09.2	125	17	45.0	-	82		
	12	151 00.4	1 10.3	+13	40.9	0 54.4	+13	24.9	13 03.5	+16	49.2	287 20.2	-14	25.1	295 40.7	126	-17	53.2	-	80		
	13	166 02.9	16 09.7		39.9	15 55.3		24.4	28 05.4		49.0	302 22.5		25.1	310 12.3	124	18	01.2	-	80		
	14	181 05.3	31 09.2		38.9	30 56.3		23.8	43 07.3		48.9	317 24.8		25.2	324 43.7	125	18	09.2	-	79		
	15	196 07.8	46 08.7	..	37.8	45 57.2	..	23.3	58 09.3	..	48.7	332 27.2	..	25.2	339 15.2	124	18	17.1	-	78		
	16	211 10.2	61 08.1		36.8	60 58.1		22.7	73 11.2		48.6	347 29.5		25.3	353 46.6	125	18	24.9	-	77		
	17	226 12.7	76 07.6		35.8	75 59.1		22.2	88 13.1		48.4	2 31.8		25.3	8 18.1	123	18	32.6	-	76		
	18	241 15.2	91 07.0	+13	34.8	91 00.0	+13	21.6	103 15.0	+16	48.3	17 34.2	-14	25.4	22 49.4	124	-18	40.2	-	75		
	19	256 17.6	106 06.5		33.7	106 00.9		21.1	118 16.9		48.1	32 36.5		25.4	37 20.8	124	18	47.7	-	74		
	20	271 20.1	121 06.0		32.7	121 01.9		20.5	133 18.9		47.9	47 38.8		25.5	51 52.2	123	18	55.1	-	74		
	21	286 22.6	136 05.4	..	31.6	136 02.8	..	20.0	148 20.8	..	47.8	62 41.2	..	25.5	66 23.5	123	19	02.5	-	72		
	22	301 25.0	151 04.9		30.6	151 03.7		19.4	163 22.7		47.6	77 43.5		25.6	80 54.8	123	19	09.7	-	72		
23	316 27.5	166 04.4		29.6	166 04.6		18.9	178 24.6		47.5	92 45.8		25.6	95 26.1	123	19	16.9	-	70			
24	0	331 30.0	181 03.8	+13	28.5	181 05.6	+13	18.3	193 26.6	+16	47.3	107 48.2	-14	25.7	109 57.4	122	-19	23.9	-	70		
	1	346 32.4	196 03.3		27.5	196 06.5		17.8	208 28.5		47.2	122 50.5		25.7	124 28.6	122	19	30.9	-	69		
	2	1 34.9	211 02.8		26.5	211 07.4		17.2	223 30.4		47.0	137 52.8		25.8	138 59.8	122	19	37.8	-	68		
	3	16 37.3	226 02.2	..	25.4	226 08.4	..	16.7	238 32.3	..	46.8	152 55.1	..	25.8	153 31.0	122	19	44.6	-	66		
	4	31 39.8	241 01.7		24.4	241 09.3		16.1	253 34.3		46.7	167 57.5		25.9	168 02.2	121	19	51.2	-	66		
	5	46 42.3	256 01.2		23.3	256 10.2		15.6	268 36.2		46.5	182 59.8		25.9	182 33.3	121	19	57.8	-	65		
	6	61 44.7	271 00.6	+13	22.3	271 11.2	+13	15.0	283 38.1	+16	46.4	198 02.1	-14	26.0	197 04.4	121	-20	04.3	-	64		
	7	76 47.2	286 00.1		21.3	286 12.1		14.4	298 40.0		46.2	213 04.5		26.0	211 35.5	121	20	10.7	-	63		
	8	91 49.7	300 59.6		20.2	301 13.0		13.9	313 41.9		46.1	228 06.8		26.1	226 06.6	121	20	17.0	-	62		
	9	106 52.1	315 59.0	..	19.2	316 14.0	..	13.3	328 43.9	..	45.9	243 09.1	..	26.1	240 37.7	120	20	23.2	-	61		
	10	121 54.6	330 58.5		18.1	331 14.9		12.8	343 45.8		45.8	258 11.4		26.2	255 08.7	120	20	29.3	-	60		
	11	136 57.1	345 58.0		17.1	346 15.8		12.2	358 47.7		45.6	273 13.8		26.2	269 39.7	120	20	35.3	-	59		
	12	151 59.5	0 57.5	+13	16.1	1 16.8	+13	11.7	13 49.6	+16	45.4	288 16.1	-14	26.3	284 10.7	120	-20	41.2	-	58		
	13	167 02.0	15 56.9		15.0	16 17.7		11.1	28 51.6		45.3	303 18.4		26.3	298 41.7	119	20	47.0	-	57		
	14	182 04.5	30 56.4		14.0	31 18.6		10.6	43 53.5		45.1	318 20.8		26.4	313 12.6	120	20	52.7	-	56		
	15	197 06.9	45 55.9	..	12.9	46 19.6	..	10.0	58 55.4	..	45.0	333 23.1	..	26.4	327 43.6	119	20	58.3	-	56		
	16	212 09.4	60 55.3		11.9	61 20.5		09.5	73 57.3		44.8	348 25.4		26.5	342 14.5	118	21	03.9	-	54		
	17	227 11.8	75 54.8		10.8	76 21.4		08.9	88 59.3		44.7	3 27.7		26.5	356 45.3	119	21	09.3	-	53		
	18	242 14.3	90 54.3	+13	09.8	91 22.4	+13	08.4	104 01.2	+16	44.5	18 30.1	-14	26.6	11 16.2	118	-21	14.6	-	52		
	19	257 16.8	105 53.8		08.7	106 23.3		07.8	119 03.1		44.3	33 32.4		26.6	25 47.0	119	21	19.8	-	51		
	20	272 19.2	120 53.2		07.7	121 24.2		07.2	134 05.0		44.2	48 34.7		26.7	40 17.9	118	21	24.9	-	50		
	21	287 21.7	135 52.7	..	06.6	136 25.2	..	06.7	149 07.0	..	44.0	63 37.0	..	26.7	54 48.7	117	21	29.9	-	49		
	22	302 24.2	150 52.2		05.6	151 26.1		06.1	164 08.9		43.9	78 39.4		26.8	69 19.4	118	21	34.8	-	48		
	23	317 26.6	165 51.7		04.5	166 27.0		05.6	179 10.8		43.7	93 41.7		26.8	83 50.2	117	21	39.6	-	47		
25	0	332 29.1	180 51.1	+13	03.5	181 28.0	+13	05.0	194 12.7	+16	43.6	108 44.0	-14	26.9	98 20.9	117	-21	44.3	-	46		
	1	347 31.6	195 50.6		02.4	196 28.9		04.5	209 14.6		43.4	123 46.3		26.9	112 51.6	117	21	48.9	-	45		
	2	2 34.0	210 50.1		01.4	211 29.8		03.9	224 16.6		43.3	138 48.7		27.0	127 22.3	117	21	53.4	-	44		
	3	17 36.5	225 49.6	..	00.3	226 30.8	..	03.4	239 18.5	..	43.1	153 51.0	..	27.0	141 53.0	116	21	57.8	-	42		
	4	32 39.0	240 49.0	12	59.3	241 31.7		02.8	254 20.4		42.9	168 53.3		27.1	156 23.6	117	22	02.0	-	42		
	5	47 41.4	255 48.5		58.2	256 32.6		02.2	269 22.3		42.8	183 55.7										

G M T	SUN		STARS				Lat.	Sunrise	Twit. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS			
	GHA	Dec.	No.	Name	SHA	Dec.								Alt.	Sun's Lower Limb	Venus	Mars
										23	24	25	26				
23	0	179 16.9 +11 47.3	7	Acamar	315 51.0 -40 28.5	72	3 15	h m	h m	h m	h m	h m	h m				
1	194 17.1	46.5	5	Achernar	335 58.5 -57 27.3	70	3 36	h m	h m	14 46	h m	h m	h m				
2	209 17.2	45.6	30	Acrux	173 58.4 -62 51.5	68	3 53	h m	h m	14 00	16 05	h m	h m				
3	224 17.4 .. 44.3		19	Adhara	255 46.8 -28 54.5	66	4 06	h m	h m	13 31	15 09	16 46	18 01				
4	239 17.6	43.9	10	Aldebaran	291 39.2 +16 25.4	64	4 17	h m	h m	13 09	14 37	15 57	17 00				
5	254 17.7	43.1				62	4 26	h m	h m	12 51	14 12	15 26	16 26				
6	269 17.9 +11 42.3		32	Alioth	166 59.0 +56 12.2	60	4 34	0 45	12 36	13 53	15 03	16 01	16 01				
7	284 18.0	41.4	34	Alkaid	153 33.2 +49 32.2	58	4 41	1 35	12 24	13 38	14 45	15 42	16 42				
8	299 18.2	40.6	55	Al Na'ir	28 37.5 -47 10.4	56	4 47	2 02	12 13	13 24	14 29	15 25	16 25				
9	314 18.4 .. 39.7		15	Alnilam	276 30.4 -1 13.6	54	4 52	2 24	12 03	13 13	14 16	15 11	16 11				
10	329 18.5	38.9	25	Alphard	218 38.9 -8 27.9	52	4 57	2 40	11 56	13 02	14 04	14 59	15 59				
11	344 18.7	38.0				50	5 02	2 53	11 48	12 53	13 54	14 48	15 48				
12	359 18.8 +11 37.2		41	Alphecca	126 47.7 +26 52.0	45	5 11	3 20	11 32	12 34	13 32	14 26	15 26				
13	14 19.0	36.4	1	Alpheratz	358 28.1 +28 50.9	40	5 19	3 39	11 19	12 19	13 15	14 08	15 08				
14	29 19.2	35.5	51	Altair	62 50.2 +8 45.2	35	5 26	3 55	11 08	12 05	13 00	13 52	14 52				
15	44 19.3 .. 34.7		2	Ankaa	353 58.0 -42 32.5	30	5 32	4 07	10 58	11 54	12 48	13 39	14 39				
16	59 19.5	33.8	42	Antares	113 19.4 -26 20.2	20	5 42	4 26	10 42	11 35	12 26	13 17	14 17				
17	74 19.6	33.0				10	5 51	4 39	10 28	11 18	12 08	12 57	13 57				
18	89 19.8 +11 32.1		37	Arcturus	146 35.3 +19 24.9	0	5 59	4 49	10 14	11 02	11 50	12 39	13 39				
19	104 20.0	31.3	43	Atria	109 00.0 -68 57.2	10	6 07	4 57	10 01	10 46	11 33	12 21	13 21				
20	119 20.1	30.4	22	Avior	234 36.4 -59 21.9	20	6 16	5 03	9 47	10 30	11 14	12 02	13 02				
21	134 20.3 .. 29.6		13	Bellatrix	279 18.6 +6 18.8	30	6 25	5 06	9 31	10 10	10 53	11 40	12 40				
22	149 20.4	28.7	16	Betelge	271 48.3 +7 24.1	35	6 31	5 07	9 22	9 59	10 41	11 27	12 27				
23	164 20.6	27.9				40	6 37	5 07	9 11	9 47	10 26	11 12	12 12				
24	0	179 20.8 +11 27.0	17	Canopus	264 15.7 -52 40.0	45	6 44	5 08	8 59	9 32	10 10	10 54	11 54				
1	194 20.9	26.2	12	Capella	281 38.6 +45 57.2	50	6 52	5 07	8 44	9 13	9 49	10 31	11 31				
2	209 21.1	25.3	53	Deneb	50 00.6 +45 07.5	52	6 56	5 06	8 37	9 05	9 39	10 21	11 21				
3	224 21.2 .. 24.5		28	Denebola	183 18.0 +14 49.2	54	7 00	5 04	8 29	8 55	9 28	10 09	11 09				
4	239 21.4	23.6	4	Diphda	349 39.0 -18 13.5	56	7 05	5 03	8 21	8 44	9 15	9 55	10 55				
5	254 21.6	22.8				58	7 10	5 01	8 11	8 32	9 01	9 39	10 39				
6	269 21.7 +11 22.0		27	Dubhe	194 45.2 +61 59.5	60	7 16	4 59	8 00	8 18	8 43	9 20	10 20				
7	284 21.9	21.1	14	Elnath	279 07.5 +28 34.3	S											
8	299 22.1	20.3	47	Eltanin	91 06.0 +51 29.9												
9	314 22.2 .. 19.4		54	Enif	34 29.3 +9 40.5												
10	329 22.4	18.5	56	Fomalhaut	16 11.3 -29 51.2												
11	344 22.6	17.7															
12	359 22.7 +11 16.8		31	Gacrux	172 49.8 -56 52.1	72	20 46	h m	h m	h m	h m	h m	h m				
13	14 22.9	16.0	29	Gienah	176 37.2 -17 17.8	70	20 25	h m	h m	17 53	h m	h m	h m				
14	29 23.0	15.1	35	Hadar	149 49.8 -60 09.9	68	20 09	h m	h m	18 39	18 14	h m	h m				
15	44 23.2 .. 14.3		6	Hamal	328 49.5 +23 15.3	66	19 57	h m	h m	19 10	19 10	19 15	19 42				
16	59 23.4	13.4	48	Kaus Aust.	84 41.0 -34 24.5	64	19 46	h m	h m	19 33	19 43	20 03	20 42				
17	74 23.5	12.6				62	19 37	h m	h m	19 51	20 08	20 34	21 16				
18	89 23.7 +11 11.7		40	Kochab	137 18.2 +74 20.5	60	19 30	23 07	20 06	20 27	20 58	21 41	22 41				
19	104 23.9	10.9	57	Makab	14 21.2 +14 58.8	58	19 23	22 24	20 19	20 43	21 16	22 01	23 01				
20	119 24.0	10.0	8	Menkar	315 00.3 +3 55.2	56	19 17	21 57	20 30	20 57	21 32	22 17	23 17				
21	134 24.2 .. 09.2		36	Menkent	148 58.9 -36 09.3	54	19 11	21 37	20 40	21 09	21 45	22 31	23 31				
22	149 24.4	08.3	24	Miap'dus	221 50.0 -69 32.1	52	19 07	21 22	20 49	21 19	21 57	22 43	23 43				
23	164 24.5	07.5				50	19 02	21 08	20 57	21 29	22 08	22 54	23 54				
24	0	179 24.7 +11 06.6	9	Mirfak	309 42.4 +49 42.2	45	18 53	20 42	21 13	21 49	22 29	23 17	24 17				
1	194 24.9	05.8	50	Nunki	76 51.7 -26 21.2	40	18 45	20 23	21 27	22 05	22 47	23 35	24 35				
2	209 25.0	04.9	52	Peacock	54 26.8 -56 52.7	35	18 38	20 08	21 39	22 18	23 02	23 50	24 50				
3	224 25.2 .. 04.0		21	Pollux	244 20.9 +28 08.1	30	18 33	19 57	21 49	22 30	23 15	24 03	25 03				
4	239 25.4	03.2	20	Procyon	245 45.3 +5 20.4	20	18 23	19 39	22 07	22 51	23 37	24 26	25 26				
5	254 25.5	02.3				10	18 14	19 26	22 23	23 08	23 56	24 45	25 45				
6	269 25.7 +11 01.5		46	R'alhague	96 46.5 +12 35.6	0	18 06	19 16	22 37	23 25	24 14	0 14	1 14				
7	284 25.9	11 00.6	26	Regulus	208 29.9 +12 11.1	10	17 58	19 09	22 52	23 42	24 32	0 32	1 32				
8	299 26.0	10 59.8	11	Rigel	281 53.8 -8 14.9	20	17 50	19 04	23 07	24 00	0 00	0 51	1 51				
9	314 26.2 .. 58.9		38	Rigel Kent.	140 51.3 -60 39.5	30	17 40	19 00	23 25	24 20	0 20	1 13	2 13				
10	329 26.4	58.0	44	Sabik	103 02.1 -15 40.3	35	17 35	19 00	23 36	24 32	0 32	1 26	2 26				
11	344 26.6	57.2				40	17 29	19 00	23 48	24 46	0 46	1 41	2 41				
12	359 26.7 +10 56.3		3	Schedar	350 29.6 +56 17.7	45	17 22	19 00	24 02	0 02	1 02	1 58	2 58				
13	14 26.9	55.5	45	Shaula	97 20.6 -37 04.5	50	17 14	19 02	24 20	0 20	1 23	2 20	3 20				
14	29 27.1	54.6	18	Sirius	259 12.1 -16 39.1	52	17 10	19 03	24 28	0 28	1 32	2 31	3 31				
15	44 27.2 .. 53.7		33	Spica	159 17.1 -10 55.9	54	17 05	19 04	24 37	0 37	1 43	2 43	3 43				
16	59 27.4	52.9	23	Suhail	223 24.8 -43 15.1	56	17 01	19 06	24 47	0 47	1 56	2 56	3 56				
17	74 27.6	52.0				58	16 56	19 08	24 59	0 59	2 10	3 12	4 12				
18	89 27.7 +10 51.2		49	Vega	81 08.0 +38 44.8	60	16 50	19 10	25 13	1 13	2 27	3 31	4 31				
19	104 27.9	50.3	39	Zub'g'bi	137 53.5 -15 51.6	S											
20	119 28.1	49.4															
21	134 28.2 .. 48.6																
22	149 28.4	47.7															
23	164 28.6	46.9															
24	179 28.8 +10 46.0																
code	-	- 8															

Moon's Lower Limb
Add

Alt. 23 24 25

0 13.1 12.5 12.2

4 13.1 12.5 12.3

8 13.2 12.5 12.3

12 13.2 12.6 12.3

16 13.2 12.6 12.4

20 13.3 12.7 12.4

24 13.3 12.7 12.5

28 13.4 12.8 12.6

32 13.5 12.9 12.7

36 13.5 13.0 12.8

40 13.6 13.1 12.9

44 13.7 13.2 13.0

48 13.8 13.4 13.2

52 13.9 13.5 13.3

56 14.0 13.6 13.5

60 14.1 13.8 13.6

G M T	Υ		VENUS - 3.5		MARS 2.0		JUPITER - 1.3		SATURN 0.8		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
h	o		o		o		o		o		o		o	
26	0	333 28.2	180 38.7	+12 38.0	181 50.4	+12 51.6	194 58.9	+16 39.8	109 39.8	-14 28.1	86 33.1	113	-23 05.5	- 21
1	348 30.7	195 38.1	37.0		196 51.3	51.1	210 00.9	39.7	124 42.1	28.2	101 03.4	113	23 07.6	- 19
2	3 33.2	210 37.6	35.9		211 52.3	50.5	225 02.8	39.5	139 44.5	28.2	115 33.7	113	23 09.5	- 18
3	18 35.6	225 37.1	34.8		226 53.2	50.0	240 04.7	39.3	154 46.8	28.3	130 04.0	113	23 11.3	- 17
4	33 38.1	240 36.6	33.8		241 54.2	49.4	255 06.6	39.2	169 49.1	28.3	144 34.3	113	23 13.0	- 17
5	48 40.6	255 36.1	32.7		256 55.1	48.8	270 08.6	39.0	184 51.4	28.4	159 04.6	112	23 14.7	- 15
6	63 43.0	270 35.6	+12 31.6		271 56.0	+12 48.3	285 10.5	+16 38.9	199 53.7	-14 28.4	173 34.8	113	-23 16.2	- 13
7	78 45.5	285 35.1	30.6		286 57.0	47.7	300 12.4	38.7	214 56.1	28.5	188 05.1	112	23 17.5	- 13
8	93 48.0	300 34.6	29.5		301 57.9	47.2	315 14.3	38.6	229 58.4	28.5	202 35.3	113	23 18.8	- 12
9	108 50.4	315 34.0	28.4		316 58.8	46.6	330 16.3	38.4	245 00.7	28.6	217 05.6	112	23 20.0	- 11
10	123 52.9	330 33.5	27.4		331 59.8	46.0	345 18.2	38.2	260 03.0	28.6	231 35.8	112	23 21.1	- 9
11	138 55.3	345 33.0	26.3		347 00.7	45.5	0 20.1	38.1	275 05.4	28.7	246 06.0	113	23 22.0	- 9
12	153 57.8	0 32.5	+12 25.2		2 01.7	+12 44.9	15 22.0	+16 37.9	290 07.7	-14 28.7	260 36.3	112	-23 22.9	- 7
13	169 00.3	15 32.0	24.1		17 02.6	44.4	30 24.0	37.8	305 10.0	28.8	275 06.5	112	23 23.6	- 6
14	184 02.7	30 31.5	23.1		32 03.5	43.8	45 25.9	37.6	320 12.3	28.8	289 36.7	112	23 24.2	- 5
15	199 05.2	45 31.0	22.0		47 04.5	43.2	60 27.8	37.5	335 14.6	28.9	304 06.9	112	23 24.7	- 4
16	214 07.7	60 30.5	20.9		62 05.4	42.7	75 29.7	37.3	350 17.0	28.9	318 37.1	111	23 25.1	- 3
17	229 10.1	75 30.0	19.8		77 06.4	42.1	90 31.7	37.2	5 19.3	29.0	333 07.2	112	23 25.4	- 2
18	244 12.6	90 29.5	+12 18.8		92 07.3	+12 41.6	105 33.6	+16 37.0	20 21.6	-14 29.0	347 37.4	112	-23 25.6	-
19	259 15.1	105 29.0	17.7		107 08.2	41.0	120 35.5	36.8	35 23.9	29.1	2 07.6	112	23 25.7	+ 1
20	274 17.5	120 28.4	16.6		122 09.2	40.4	135 37.4	36.7	50 26.2	29.1	16 37.8	112	23 25.6	+ 1
21	289 20.0	135 27.9	15.5		137 10.1	39.9	150 39.4	36.5	65 28.6	29.2	31 08.0	111	23 25.5	+ 3
22	304 22.4	150 27.4	14.4		152 11.0	39.3	165 41.3	36.4	80 30.9	29.2	45 38.1	112	23 25.2	+ 4
23	319 24.9	165 26.9	13.4		167 12.0	38.8	180 43.2	36.2	95 33.2	29.3	60 08.3	112	23 24.8	+ 5
27	0	334 27.4	180 26.4	+12 12.3	182 12.9	+12 38.2	195 45.2	+16 36.1	110 35.5	-14 29.4	74 38.5	112	-23 24.3	+ 5
1	349 29.8	195 25.9	11.2		197 13.9	37.6	210 47.1	35.9	125 37.8	29.4	89 08.7	111	23 23.8	+ 8
2	4 32.3	210 25.4	10.1		212 14.8	37.1	225 49.0	35.7	140 40.2	29.5	103 38.8	112	23 23.0	+ 8
3	19 34.8	225 24.9	09.0		227 15.7	36.5	240 50.9	35.6	155 42.5	29.5	118 09.0	112	23 22.2	+ 9
4	34 37.2	240 24.4	08.0		242 16.7	35.9	255 52.9	35.4	170 44.8	29.6	132 39.2	112	23 21.3	+ 10
5	49 39.7	255 23.9	06.9		257 17.6	35.4	270 54.8	35.3	185 47.1	29.6	147 09.4	111	23 20.3	+ 12
6	64 42.2	270 23.4	+12 05.8		272 18.6	+12 34.8	285 56.7	+16 35.1	200 49.4	-14 29.7	161 39.5	112	-23 19.1	+ 12
7	79 44.6	285 22.9	04.7		287 19.5	34.3	300 58.6	35.0	215 51.7	29.7	176 09.7	112	23 17.9	+ 14
8	94 47.1	300 22.4	03.6		302 20.4	33.7	316 00.6	34.8	230 54.1	29.8	190 39.9	112	23 16.5	+ 15
9	109 49.6	315 21.9	02.5		317 21.4	33.1	331 02.5	34.6	245 56.4	29.8	205 10.1	112	23 15.0	+ 16
10	124 52.0	330 21.4	01.4		332 22.3	32.6	346 04.4	34.5	260 58.7	29.9	219 40.3	112	23 13.4	+ 17
11	139 54.5	345 20.9	12 00.4		347 23.3	32.0	1 06.4	34.3	276 01.0	29.9	234 10.5	112	23 11.7	+ 18
12	154 56.9	0 20.4	+11 59.3		2 24.2	+12 31.4	16 08.3	+16 34.2	291 03.3	-14 30.0	248 40.7	112	-23 09.9	+ 19
13	169 59.4	15 19.9	58.2		17 25.1	30.9	31 10.2	34.0	306 05.7	30.0	263 10.9	112	23 08.0	+ 20
14	185 01.9	30 19.4	57.1		32 26.1	30.3	46 12.1	33.9	321 08.0	30.1	277 41.1	112	23 06.0	+ 21
15	200 04.3	45 18.9	56.0		47 27.0	29.7	61 14.1	33.7	336 10.3	30.1	292 11.3	113	23 03.9	+ 23
16	215 06.8	60 18.4	54.9		62 28.0	29.2	76 16.0	33.5	351 12.6	30.2	306 41.6	112	23 01.6	+ 23
17	230 09.3	75 17.9	53.8		77 28.9	28.6	91 17.9	33.4	6 14.9	30.2	321 11.8	113	22 59.3	+ 25
18	245 11.7	90 17.4	+11 52.7		92 29.9	+12 28.0	106 19.9	+16 33.2	21 17.2	-14 30.3	335 42.1	112	-22 56.8	+ 26
19	260 14.2	105 16.9	51.6		107 30.8	27.5	121 21.8	33.1	36 19.6	30.4	350 12.3	113	22 54.2	+ 27
20	275 16.7	120 16.4	50.5		122 31.7	26.9	136 23.7	32.9	51 21.9	30.4	4 42.6	113	22 51.5	+ 28
21	290 19.1	135 15.9	49.5		137 32.7	26.4	151 25.6	32.8	66 24.2	30.5	19 12.9	112	22 48.7	+ 29
22	305 21.6	150 15.4	48.4		152 33.6	25.8	166 27.6	32.6	81 26.5	30.5	33 43.1	113	22 45.8	+ 30
23	320 24.1	165 14.9	47.3		167 34.6	25.2	181 29.5	32.5	96 28.8	30.6	48 13.4	113	22 42.8	+ 31
28	0	335 26.5	180 14.4	+11 46.2	182 35.5	+12 24.7	196 31.4	+16 32.3	111 31.1	-14 30.6	62 43.7	114	-22 39.7	+ 32
1	350 29.0	195 13.9	45.1		197 36.4	24.1	211 33.4	32.1	126 33.5	30.7	77 14.1	113	22 36.5	+ 33
2	5 31.4	210 13.4	44.0		212 37.4	23.5	226 35.3	32.0	141 35.8	30.7	91 44.4	113	22 33.2	+ 35
3	20 33.9	225 12.9	42.9		227 38.3	23.0	241 37.2	31.8	156 38.1	30.8	106 14.7	114	22 29.7	+ 35
4	35 36.4	240 12.4	41.8		242 39.3	22.4	256 39.1	31.7	171 40.4	30.8	120 45.1	114	22 26.2	+ 37
5	50 38.8	255 11.9	40.7		257 40.2	21.8	271 41.1	31.5	186 42.7	30.9	135 15.5	113	22 22.5	+ 37
6	65 41.3	270 11.4	+11 39.6		272 41.2	+12 21.3	286 43.0	+16 31.4	201 45.0	-14 30.9	149 45.8	114	-22 18.8	+ 39
7	80 43.8	285 11.0	38.5		287 42.1	20.7	301 44.9	31.2	216 47.3	31.0	164 16.2	115	22 14.9	+ 40
8	95 46.2	300 10.5	37.4		302 43.0	20.1	316 46.9	31.0	231 49.7	31.0	178 46.7	114	22 10.9	+ 41
9	110 48.7	315 10.0	36.3		317 44.0	19.6	331 48.8	30.9	246 52.0	31.1	193 17.1	114	22 06.8	+ 41
10	125 51.2	330 09.5	35.2		332 44.9	19.0	346 50.7	30.7	261 54.3	31.1	207 47.5	115	22 02.7	+ 43
11	140 53.6	345 09.0	34.1		347 45.9	18.4	1 52.6	30.6	276 56.6	31.2	222 18.0	115	21 58.4	+ 44
12	155 56.1	0 08.5	+11 33.0		2 46.8	+12 17.9	16 54.6	+16 30.4	291 58.9	-14 31.3	236 48.5	115	-21 54.0	+ 45
13	170 58.5	15 08.0	31.9		17 47.8	17.3	31 56.5	30.3	307 01.2	31.3	251 19.0	115	21 49.5	+ 46
14	186 01.0	30 07.5	30.8		32 48.7	16.7	46 58.4	30.1	322 03.5	31.4	265 49.5	115	21 44.9	+ 47
15	201 03.5	45 07.0	29.7		47 49.6	16.2	62 00.4	29.9	337 05.9	31.4	280 20.0	115	21 40.2	+ 49
16	216 05.9	60 06.5	28.6		62 50.6	15.6	77 02.3	29.8	352 08.2	31.5	294 50.5	116	21 35.3	+ 49
17	231 08.4	75 06.0	27.5		77 51.5	15.0	92 04.2	29.6	7 10.5	31.5	309 21.1	116	21 30.4	+ 50
18	246 10.9	90 05.6	+11 26.4		92 52.5	+12 14.5	107 06.2	+16 29.5	22 12.8	-14 31.6	323 51.7	116	-21 25.4	+ 51
19	261 13.3	105 05.1	25.3		107 53.4	13.9	122 08.1	29.3	37 15.1	31.6	338 22.3	116	21 20.3	+ 53
20	276 15.8	120 04.6	24.2		122 54.4	13.3	137 10.0	29.2	52 17.4	31.7	352 52.9	116	21 15.0	+ 53
21	291 18.3	135 04.1	23.1		137 55.3	12.8	152 11.9	29.0	67 19.7	31.7	7 23.5	117	21 09.7	+ 54
22	306 20.7	150 03.6	22.0		152 56.3	12.2	167 13.9	28.8	82 22.1	31.8	21 54.2	116	21 04.3	+ 56
23	321 23.2	165 03.1	20.9		167 57.2	11.6	182 15.8	28.7	97 24.4	31.8	36 24.8	117	20 58.7	+ 56
24	336 25.7	180 02.6	+11 19.8		182 58.1	+12 11.1	197 17.7	+16 28.5	112 26.7	-14 31.9	50 55.5	118	-20 53.1	+ 57
code	-	- 5	- 11		+ 9	- 5	+ 19	- 2	+ 24	0				

G M T	SUN			STARS			Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS			
	GHA	Dec.	No.	Name	SHA	Dec.				26	27	28	29	Alt.	Sun's Low'r Limb Add	Venus Add	Mars Add
26	0	179 28.8 +10 46.0		7	Acamar	315 51.0 -40 28.5	72	3 32	////	h m	h m	h m	h m				
	1	194 28.9	45.1	5	Achernar	335 58.5 -57 27.3	70	3 50	////	h m	h m	h m	h m	19 51			
	2	209 29.1	44.3	30	Acrux	173 58.5 -62 51.4	68	4 04	////	h m	h m	h m	h m	19 31	19 05		
	3	224 29.3 .. 43.4		19	Adhara	255 46.8 -28 54.5	66	4 16	////	18 01	18 28	18 34	18 34				
	4	239 29.4	42.5	10	Aldebaran	291 39.1 +16 25.4	64	4 26	////	17 00	17 40	18 00	18 11				
	5	254 29.6	41.7				62	4 34	////	16 26	17 09	17 36	17 53				
	6	269 29.8 +10 40.8		32	Alioth	166 59.0 +56 12.1	60	4 41	1 16	16 01	16 45	17 16	17 38				
	7	284 30.0	39.9	34	Alkaid	153 33.2 +49 32.2	58	4 47	1 50	15 42	16 27	17 00	17 25				
	8	299 30.1	39.1	55	Al Na'ir	28 37.5 -47 10.4	56	4 53	2 15	15 25	16 11	16 46	17 13				
	9	314 30.3 .. 38.2		15	Alnilam	276 30.4 - 1 13.6	54	4 58	2 33	15 11	15 57	16 34	17 04				
	10	329 30.5	37.4	25	Alphard	218 38.9 - 8 27.9	52	5 02	2 48	14 59	15 45	16 24	16 55				
	11	344 30.7	36.5				50	5 06	3 01	14 48	15 35	16 14	16 47				
	12	359 30.8 +10 35.6		41	Alphecca	126 47.7 +26 52.0	45	5 15	3 26	14 26	15 13	15 54	16 30				
	13	14 31.0	34.8	1	Alpheratz	358 28.1 +28 50.9	40	5 22	3 44	14 08	14 55	15 38	16 16				
	14	29 31.2	33.9	51	Altair	62 50.2 + 8 45.2	35	5 28	3 59	13 52	14 41	15 25	16 04				
	15	44 31.4 .. 33.0		2	Ankaa	353 57.9 -42 32.5	30	5 34	4 09	13 39	14 28	15 13	15 54				
	16	59 31.5	32.2	42	Antares	113 19.4 -26 20.2	20	5 43	4 27	13 17	14 06	14 52	15 36				
	17	74 31.7	31.3				10	5 51	4 40	12 57	13 47	14 34	15 21				
	18	89 31.9 +10 30.4		37	Arcturus	146 35.4 +19 24.9	0	5 58	4 49	12 39	13 29	14 18	15 06				
	19	104 32.0	29.6	43	Atria	109 00.0 -68 57.2	10	6 06	4 55	12 21	13 11	14 01	14 51				
	20	119 32.2	28.7	22	Avior	234 36.4 -59 21.9	20	6 13	5 00	12 02	12 52	13 43	14 36				
	21	134 32.4 .. 27.8		13	Bellatrix	279 18.6 + 6 18.8	30	6 22	5 03	11 40	12 30	13 23	14 18				
	22	149 32.6	26.9	16	Betelge'se	271 4											

G M T	VENUS - 3.5		MARS 2.0		JUPITER - 1.3		SATURN 0.8		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
29	h	°	°	°	°	°	°	°	°	°	°	°
0	336 25.7	180 02.6 +11 19.8	182 58.1 +12 11.1	197 17.7 +16 28.5	112 26.7 -14 31.9	50 55.5 118 -20 53.1 + 57						
1	351 28.1	195 02.1 18.6	197 59.1 10.5	212 19.7 28.4	127 29.0 32.0	65 26.3 117 20 47.4 + 59						
2	6 30.6	210 01.7 17.5	213 00.0 09.9	227 21.6 28.2	142 31.3 32.0	79 57.0 117 20 41.5 + 59						
3	21 33.0	225 01.2 .. 16.4	228 01.0 .. 09.3	242 23.5 .. 28.1	157 33.6 .. 32.1	94 27.7 118 -20 35.6 + 60						
4	36 35.5	240 00.7 15.3	243 01.9 08.8	257 25.5 27.9	172 35.9 32.1	108 58.5 118 20 29.6 + 62						
5	51 38.0	255 00.2 14.2	258 02.9 08.2	272 27.4 27.7	187 38.2 32.2	123 29.3 118 20 23.4 + 62						
6	66 40.4	269 59.7 +11 13.1	273 03.8 +12 07.6	287 29.3 +16 27.6	202 40.6 -14 32.2	138 00.1 119 -20 17.2 + 63						
7	81 42.9	284 59.2 12.0	288 04.8 07.1	302 31.2 27.4	217 42.9 32.3	152 31.0 118 20 10.9 + 65						
8	96 45.4	299 58.7 10.9	303 05.7 06.5	317 33.2 27.3	232 45.2 32.3	167 01.8 119 20 04.4 + 65						
9	111 47.8	314 58.3 .. 09.8	318 06.7 .. 05.9	332 35.1 .. 27.1	247 47.5 .. 32.4	181 32.7 119 -19 57.9 + 66						
10	126 50.3	329 57.8 08.6	333 07.6 05.4	347 37.0 27.0	262 49.8 32.4	196 03.6 120 19 51.3 + 68						
11	141 52.8	344 57.3 07.5	348 08.5 04.8	2 39.0 26.8	277 52.1 32.5	210 34.6 119 19 44.5 + 68						
12	156 55.2	359 56.8 +11 06.4	3 09.5 +12 04.2	17 40.9 +16 26.7	292 54.4 -14 32.6	225 05.5 120 -19 37.7 + 69						
13	171 57.7	14 56.3 05.3	18 10.4 03.6	32 42.8 26.5	307 56.7 32.6	239 36.5 120 19 30.8 + 70						
14	187 00.2	29 55.9 04.2	33 11.4 03.1	47 44.8 26.3	322 59.0 32.7	254 07.5 120 19 23.8 + 71						
15	202 02.6	44 55.4 .. 03.1	48 12.3 .. 02.5	62 46.7 .. 26.2	338 01.4 .. 32.7	268 38.5 120 -19 16.7 + 72						
16	217 05.1	59 54.9 02.0	63 13.3 01.9	77 48.6 26.0	353 03.7 32.8	283 09.5 121 19 09.5 + 73						
17	232 07.5	74 54.4 11 00.8	78 14.2 01.4	92 50.6 25.9	8 06.0 32.8	297 40.6 121 19 02.2 + 74						
18	247 10.0	89 53.9 +10 59.7	93 15.2 +12 00.8	107 52.5 +16 25.7	23 08.3 -14 32.9	312 11.7 121 -18 54.8 + 75						
19	262 12.5	104 53.5 58.6	108 16.1 12 00.2	122 54.4 25.6	38 10.6 32.9	326 42.8 121 18 47.3 + 76						
20	277 14.9	119 53.0 57.5	123 17.1 11 59.7	137 56.4 25.4	53 12.9 33.0	341 13.9 122 18 39.7 + 76						
21	292 17.4	134 52.5 .. 56.4	138 18.0 .. 59.1	152 58.3 .. 25.2	68 15.2 .. 33.0	355 45.1 122 -18 32.1 + 78						
22	307 19.9	149 52.0 55.3	153 19.0 58.5	168 00.2 25.1	83 17.5 33.1	10 16.3 122 18 24.3 + 78						
23	322 22.3	164 51.5 54.1	168 19.9 57.9	183 02.1 24.9	98 19.8 33.2	24 47.5 122 18 16.5 + 80						
30	0	337 24.8	179 51.1 +10 53.0	183 20.9 +11 57.4	198 04.1 +16 24.8	113 22.1 -14 33.2	39 18.7 122 -18 08.5 + 80					
1	352 27.3	194 50.6 51.9	198 21.8 56.8	213 06.0 24.6	128 24.4 33.3	53 49.9 123 18 00.5 + 81						
2	7 29.7	209 50.1 50.8	213 22.7 56.2	228 07.9 24.5	143 26.8 33.3	68 21.2 123 17 52.4 + 82						
3	22 32.2	224 49.6 .. 49.7	228 23.7 .. 55.7	243 09.9 .. 24.3	158 29.1 .. 33.4	82 52.5 123 -17 44.2 + 83						
4	37 34.7	239 49.1 48.5	243 24.6 55.1	258 11.8 24.1	173 31.4 33.4	97 23.8 124 17 35.9 + 84						
5	52 37.1	254 48.7 47.4	258 25.6 54.5	273 13.7 24.0	188 33.7 33.5	111 55.2 123 17 27.5 + 85						
6	67 39.6	269 48.2 +10 46.3	273 26.5 +11 53.9	288 15.7 +16 23.8	203 36.0 -14 33.5	126 26.5 124 -17 19.0 + 86						
7	82 42.0	284 47.7 45.2	288 27.5 53.4	303 17.6 23.7	218 38.3 33.6	140 57.9 124 17 10.4 + 86						
8	97 44.5	299 47.2 44.0	303 28.4 52.8	318 19.5 23.5	233 40.6 33.6	155 29.3 124 17 01.8 + 87						
9	112 47.0	314 46.8 .. 42.9	318 29.4 .. 52.2	333 21.5 .. 23.4	248 42.9 .. 33.7	170 00.7 125 -16 53.1 + 88						
10	127 49.4	329 46.3 41.8	333 30.3 51.6	348 23.4 23.2	263 45.2 33.8	184 32.2 125 16 44.3 + 89						
11	142 51.9	344 45.8 40.7	348 31.3 51.1	3 25.3 23.0	278 47.5 33.8	199 03.7 125 16 35.4 + 90						
12	157 54.4	359 45.3 +10 39.5	3 32.2 +11 50.5	18 27.3 +16 22.9	293 49.8 -14 33.9	213 35.2 125 -16 26.4 + 91						
13	172 56.8	14 44.9 38.4	18 33.2 49.9	33 29.2 22.7	308 52.1 33.9	228 06.7 125 16 17.3 + 91						
14	187 59.3	29 44.4 37.3	33 34.1 49.4	48 31.1 22.6	323 54.5 34.0	242 38.2 126 16 08.2 + 93						
15	203 01.8	44 43.9 .. 36.2	48 35.1 .. 48.8	63 33.1 .. 22.4	338 56.8 .. 34.0	257 09.8 126 -15 58.9 + 93						
16	218 04.2	59 43.5 35.0	63 36.0 48.2	78 35.0 22.3	353 59.1 34.1	271 41.4 126 15 49.6 + 94						
17	233 06.7	74 43.0 33.9	78 37.0 47.6	93 36.9 22.1	9 01.4 34.1	286 13.0 126 15 40.2 + 94						
18	248 09.1	89 42.5 +10 32.8	93 37.9 +11 47.1	108 38.9 +16 21.9	24 03.7 -14 34.2	300 44.6 126 -15 30.8 + 96						
19	263 11.6	104 42.0 31.6	108 38.9 46.5	123 40.8 21.8	39 06.0 34.3	315 16.2 127 15 21.2 + 96						
20	278 14.1	119 41.6 30.5	123 39.8 45.9	138 42.7 21.6	54 08.3 34.3	329 47.9 127 15 11.6 + 97						
21	293 16.5	134 41.1 .. 29.4	138 40.8 .. 45.3	153 44.7 .. 21.5	69 10.6 .. 34.4	344 19.6 127 -15 01.9 + 98						
22	308 19.0	149 40.6 28.3	153 41.7 44.8	168 46.6 21.3	84 12.9 34.4	358 51.3 127 14 52.1 + 98						
23	323 21.5	164 40.2 27.1	168 42.7 44.2	183 48.5 21.2	99 15.2 34.5	13 23.0 128 14 42.3 +100						
31	0	338 23.9	179 39.7 +10 26.0	183 43.6 +11 43.6	198 50.5 +16 21.0	114 17.5 -14 34.5	27 54.8 127 -14 32.3 +100					
1	353 26.4	194 39.2 24.9	198 44.6 43.0	213 52.4 20.8	129 19.8 34.6	42 26.5 128 14 22.3 +101						
2	8 28.9	209 38.8 23.7	213 45.5 42.5	228 54.3 20.7	144 22.1 34.6	56 58.3 128 14 12.2 +101						
3	23 31.3	224 38.3 .. 22.6	228 46.5 .. 41.9	243 56.3 .. 20.5	159 24.4 .. 34.7	71 30.1 128 -14 02.1 +102						
4	38 33.8	239 37.8 21.5	243 47.4 41.3	258 58.2 20.4	174 26.7 34.8	86 01.9 129 13 51.9 +103						
5	53 36.3	254 37.3 20.3	258 48.4 40.7	274 00.1 20.2	189 29.0 34.8	100 33.8 128 13 41.6 +104						
6	68 38.7	269 36.9 +10 19.2	273 49.3 +11 40.2	289 02.1 +16 20.1	204 31.4 -14 34.9	115 05.6 129 -13 31.2 +105						
7	83 41.2	284 36.4 18.0	288 50.3 39.6	304 04.0 19.9	219 33.7 34.9	129 37.5 129 13 20.7 +105						
8	98 43.6	299 35.9 16.9	303 51.2 39.0	319 05.9 19.7	234 36.0 35.0	144 09.4 129 13 10.2 +106						
9	113 46.1	314 35.5 .. 15.8	318 52.2 .. 38.4	334 07.9 .. 19.6	249 38.3 .. 35.0	158 41.3 129 -12 59.6 +106						
10	128 48.6	329 35.0 14.6	333 53.1 37.9	349 09.8 19.4	264 40.6 35.1	173 13.2 130 12 49.0 +107						
11	143 51.0	344 34.5 13.5	348 54.1 37.3	4 11.7 19.3	279 42.9 35.1	187 45.2 129 12 38.3 +108						
12	158 53.5	359 34.1 +10 12.4	3 55.0 +11 36.7	19 13.7 +16 19.1	294 45.2 -14 35.2	202 17.1 130 -12 27.5 +109						
13	173 56.0	14 33.6 11.2	18 56.0 36.1	34 15.6 19.0	309 47.5 35.3	216 49.1 130 12 16.6 +109						
14	188 58.4	29 33.2 10.1	33 56.9 35.6	49 17.5 18.8	324 49.8 35.3	231 21.1 130 12 05.7 +110						
15	204 00.9	44 32.7 .. 08.9	48 57.9 .. 35.0	64 19.5 .. 18.6	339 52.1 .. 35.4	245 53.1 130 -11 54.7 +110						
16	219 03.4	59 32.2 07.8	63 58.8 34.4	79 21.4 18.5	354 54.4 35.4	260 25.1 130 11 43.7 +111						
17	234 05.8	74 31.8 06.7	78 59.8 33.8	94 23.3 18.3	9 56.7 35.5	274 57.1 130 11 32.6 +112						
18	249 08.3	89 31.3 +10 05.5	94 00.7 +11 33.3	109 25.3 +16 18.2	24 59.0 -14 35.5	289 29.1 131 -11 21.4 +112						
19	264 10.7	104 30.8 04.4	109 01.7 32.7	124 27.2 18.0	40 01.3 35.6	304 01.2 131 11 10.2 +113						
20	279 13.2	119 30.4 03.2	124 02.6 32.1	139 29.1 17.9	55 03.6 35.7	318 33.3 130 10 58.9 +114						
21	294 15.7	134 29.9 .. 02.1	139 03.6 .. 31.5	154 31.1 .. 17.7	70 05.9 .. 35.7	333 05.3 131 -10 47.5 +114						
22	309 18.1	149 29.4 10 01.0	154 04.5 30.9	169 33.0 17.5	85 08.2 35.8	347 37.4 131 10 36.1 +115						
23	324 20.6	164 29.0 9 59.8	169 05.5 30.4	184 34.9 17.4	100 10.5 35.8	2 09.5 131 10 24.6 +115						
24	339 23.1	179 28.5 + 9 58.7	184 06.4 +11 29.8	199 36.9 +16 17.2	115 12.8 -14 35.9	16 41.6 131 -10 13.1 +116						
code	-	- 4	- 11	+ 10	- 6	+ 19	- 2	+ 23	0			

G M T	SUN			STARS			Lat.	Sunrise	Twilt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS															
	GHA	Dec.	No.	Name	SHA	Dec.				29	30	31	1	Sun's Lower Limb Add	Venus Add	Mars Add													
h	°	'	°	°	'	°	N	h	m	h	m	h	m	h	m	h	m	Alt.	°	'	°	'	°	'					
29	0	179	41.6	+	9	43.2	7	Acamar	315	51.0	-40	28.5	72	3	47	////	19	50	19	15	18	51	Alt.	°	'	°	'	°	'
	1	194	41.7			42.3	5	Achernar	335	58.5	-57	27.3	70	4	03	////	19	51	19	17	18	57							
	2	209	41.9			41.4	30	Acrux	173	58.5	-62	51.4	68	4	16	////	19	05	18	52	18	43							
	3	224	42.1	..		40.5	19	Adhara	255	46.8	-28	54.4	66	4	26	////	18	34	18	33	18	31							
	4	239	42.3			39.6	10	Aldebaran	291	39.1	+16	25.4	64	4	34	////	18	11	18	17	18	21							
	5	254	42.5			38.7	32	Alioth	166	59.0	+56	12.1	60	4	48		0	49	17	53	18	04							
	6	269	42.7	+	9	37.9	34	Alkaid	153	33.2	+49	32.2	58	4	54		2	05	17	25	17	43							
	7	284	42.8			37.0	55	Al Na'ir	28	37.5	-47	10.4	56	4	59		2	26	17	13	17	35							
	8	299	43.0			36.1	15	Alnilam	276	30.4	-1	13.6	54	5	03		2	42	17	04	17	27							
	9	314	43.2	..		35.2	25	Alphard	218	38.9	-8	27.9	52	5	07		2	55	16	55	17	21							
	10	329	43.4			34.3							50	5	11		3	07	16	47	17	14							
	11	344	43.6			33.4							45	5	18		3	30	16	30	17	01							
	12	359	43.8	+	9	32.5	41	Alphecca	126	47.7	+26	52.0	40	5	25		3	48	16	16	16	50							
	13	14	44.0			31.7	1	Alpheratz	358	28.0	+28	50.9	40	5	25		3	48	16	16	16	50							
	14	29	44.1			30.8	51	Altair	62	50.2	+8	45.2	35	5	31		4	01	16	04	16	41							
	15	44	44.3	..		29.9	2	Ankaa	353	57.9	-42	32.5	30	5	35		4	12	15	54	16	32							
	16	59	44.5			29.0	42	Antares	113	19.4	-26	20.2	20	5	44		4	28	15	36	16	18							
	17	74	44.7			28.1							10	5	51		4	40	15	21	16	05							
	18	89	44.9	+	9	27.2	37	Arcturus	146	35.4	+19	24.9	0	5	57		4	48	15	06	15	54							
	19	104	45.1			26.3	43	Atria	109	00.1	-68	57.2	10	6	04		4	55	14	51	15	42							
	20	119	45.3			25.5	22	Avior	234	36.3	-59	21.9	20	6	11		4	58	14	36	15	29							
	21	134	45.4	..		24.6	13	Bellatrix	279	18.5	+6	18.8	30	6	18		5	00	14	18	15	14							
	22	149	45.6			23.7	16	Belte'ge	271	48.3	+7	24.1	35	6	23		5	00	14	07	15	06							
	23	164	45.8			22.8							40	6	28		4	59	13	55	14	56							
							17	Canopus	264	15.7	-52	40.0	45	6	33		4	57	13	41	14	45							
							12	Capella	281	38.6	+45	57.2	50	6	40		4	54	13	23	14	31							
							53	Deneb	50	00.6	+45	07.5	52	6	43		4	53	13	15	14	25							
							28	Denebola	183	18.1	+14	49.2	54	6	47		4	51	13	06	14	17							
							4	Diphda	349	39.0	-18	13.5	56	6	50		4	49	12	55	14	09							
													58	6	55		4	46	12	44	14	00							
													60	6	59		4	43	12	30	13	50							
							S																						
							Lat.	Sunset				Twilt. ends																	
							N		h	m		h	m		h	m		h	m		h	m							
							29	Gienah	176	37.2	-17	17.8	70	19	55		22	57	25	10	1	10							
							35	Hadar	149	49.8	-60	09.9	68	19	43		23	43	25	34	1	34							
							6	Hama	328	49.5	+23	15.3	66	19	33		24	12	0	12	1	52							
							48	Kaus Aust.	84	41.0	-34	24.5	64	19	25		24	35	0	35	2	06							
													62	19	18		23	00	24	52	0	52							
							40	Kochab	137	18.3	+74	20.4	60	19	12		22	18	25	07	1	07							
							57	Markab	14	21.2	+14	58.2	58	19	06		21	51	0	05	1	19							
							8	Menkar	315	00.2	+3	55.2	56	19	02		21	32	0	18	1	30							
							36	Menkent	148	58.9	-36	09.3	54	18	57		21	15	0	30	1	39							
							24	Miap'hdus	221	49.9	-69	32.0	52	18	53		21	02	0	40	1	48							
													50	18	50		20	51	0	49	1	55							
							9	Mirfak	309	42.3	+49	42.2	45	18	42		20	28	1	09	2	11							
							50	Nunki	76	51.7	-26	21.2	40	18	36		20	12	1	24	2	24							
							52	Pecock	54	26.8	-56	52.7	35	18	30		19	58	1	37	2	35							
							21	Pollux	244	20.9	+28	08.1	30	18	26		19	49	1	49	2	45							
							20	Procyon	245	45.3	+5	20.4	20	18	18		19	33	2	08	3	01							
													10	18	11		19	22	2	25	3	16							
													0	18	04		19	14	2	41	3	29							
							46	R'halague	96	46.5	+12	35.6	10	17	58		19	08	2	57	3	42							
							11	Rigel	281	53.7	-8	14.9	20	17	51		19	05	3	14	3	56							
							38	Rigil Kent	140	51.3	-60	39.5	30	17	44		19	04	3	33	4	12							
							44	Sabik	103	02.1	-15	40.3	35	17	39		19	03	3	44	4	22							
													40	17	34		19	04	3	57	4	32							
							3	Schedar	350	29.6	+56	17.7	45	17	29		19	07	4	12	4	45							
							45	Shaula	97	20.6	-37	04.5	50	17	22		19	10	4	30	5	00							
							18	Sirius	259	12.1	-16	39.1	52	17	19		19	11	4	39	5	07							
							33	Spica	159	17.1	-10	55.9	54	17	16		19	14	4	48	5	14							
							23	Suhail	223	24.8	-43	15.1	56	17	12		19	16	4	59	5	23							
													58	17	08		19	19	5	11	5	33							
							49	Vega	81	08.1	+38	44.8	60	17	04		19	23	5	26	5	44							
							39	Zub'g'bi	137	53.5	-15	51.6	S																
							G M T	Equation of Time (App.—Mean)					GMT of Transit Meridian of Greenwich																
								29				30				31													
							h	m	s		m	s		m	s		DAY	Moon	Venus	Mars	Jupiter	Saturn							
							0	-	1	14.2	-	0	56.4	-	0	38.2		h	m	h	m	h	m	h	m	h	m		
							6	-	1	09.8	-	0	51.9	-	0	33.6	29	21	18	12	00	11	47	10	49	16	28		
							12	-	1	05.3	-																		

G M T	VENUS — 3.5		MARS 2.0		JUPITER — 1.3		SATURN 0.8		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
1	339 23.1	179 28.5 + 9 58.7	184 06.4 +11 29.8	199 36.9 +16 17.2	115 12.8 -14 35.9	16 41.6 131 -10 13.1 +116						
2	354 25.5	194 28.1 57.5	199 07.4 29.2	214 38.8 17.1	130 15.1 35.9	31 13.7 131 10 01.5 +116						
3	9 28.0	209 27.6 56.4	214 08.3 28.6	229 40.8 16.9	145 17.4 36.0	45 45.8 132 9 49.9 +117						
4	24 30.5	224 27.1 .. 55.2	229 09.3 .. 28.1	244 42.7 .. 16.8	160 19.7 .. 36.0	60 18.0 131 .. 9 38.2 +118						
5	39 32.9	239 26.7 54.1	244 10.2 27.5	259 44.6 16.6	175 22.0 36.1	74 50.1 132 9 26.4 +118						
6	54 35.4	254 26.2 52.9	259 11.2 26.9	274 46.6 16.4	190 24.3 36.2	89 22.3 131 9 14.6 +119						
7	69 37.9	269 25.8 + 9 51.8	274 12.1 +11 26.3	289 48.5 +16 16.3	205 26.6 -14 36.2	103 54.4 132 - 9 02.7 +119						
8	84 40.3	284 25.3 50.6	289 13.1 25.7	304 50.4 16.1	220 28.9 36.3	118 26.6 131 8 50.8 +119						
9	99 42.8	299 24.8 49.5	304 14.0 25.2	319 52.4 16.0	235 31.2 36.3	132 58.7 132 8 38.9 +120						
10	114 45.2	314 24.4 .. 48.4	319 15.0 .. 24.6	334 54.3 .. 15.8	250 33.5 .. 36.4	147 30.9 132 .. 8 26.9 +121						
11	129 47.7	329 23.9 47.2	334 16.0 24.0	349 56.2 15.7	265 35.8 36.4	162 03.1 132 8 14.8 +121						
12	144 50.2	344 23.5 46.1	349 16.9 23.4	4 58.2 15.5	280 38.1 36.5	176 35.3 131 8 02.7 +122						
13	159 52.6	359 23.0 + 9 44.9	4 17.9 +11 22.8	20 00.1 +16 15.3	295 40.4 -14 36.6	191 07.4 132 - 7 50.5 +122						
14	174 55.1	14 22.6 43.8	19 18.8 22.3	35 02.0 15.2	310 42.7 36.6	205 39.6 132 7 38.3 +122						
15	189 57.6	29 22.1 42.6	34 19.8 21.7	50 04.0 15.0	325 45.0 36.7	220 11.8 132 7 26.1 +123						
16	205 00.0	44 21.6 .. 41.5	49 20.7 .. 21.1	65 05.9 .. 14.9	340 47.3 .. 36.7	234 44.0 132 .. 7 13.8 +123						
17	220 02.5	59 21.2 40.3	64 21.7 20.5	80 07.9 14.7	355 49.6 36.8	249 16.2 132 7 01.5 +124						
18	235 05.0	74 20.7 39.2	79 22.6 20.0	95 09.8 14.6	10 51.9 36.8	263 48.4 132 6 49.1 +124						
19	250 07.4	89 20.3 + 9 38.0	94 23.6 +11 19.4	110 11.7 +16 14.4	25 54.2 -14 36.9	278 20.6 131 - 6 36.7 +125						
20	265 09.9	104 19.8 36.8	109 24.5 18.8	125 13.7 14.3	40 56.5 37.0	292 52.7 132 6 24.2 +125						
21	280 12.4	119 19.4 35.7	124 25.5 18.2	140 15.6 14.1	55 58.8 37.0	307 24.9 132 6 11.7 +125						
22	295 14.8	134 18.9 .. 34.5	139 26.4 .. 17.6	155 17.5 .. 13.9	71 01.1 .. 37.1	321 57.1 132 .. 5 59.2 +126						
23	310 17.3	149 18.5 33.4	154 27.4 17.1	170 19.5 13.8	86 03.4 37.1	336 29.3 132 5 46.6 +126						
24	325 19.7	164 18.0 32.2	169 28.4 16.5	185 21.4 13.6	101 05.7 37.2	351 01.5 131 5 34.0 +127						
2	340 22.2	179 17.6 + 9 31.1	184 29.3 +11 15.9	200 23.3 +16 13.5	116 08.0 -14 37.2	5 33.6 132 - 5 21.3 +127						
3	355 24.7	194 17.1 29.9	199 30.3 15.3	215 25.3 13.3	131 10.3 37.3	20 05.8 131 5 08.6 +127						
4	10 27.1	209 16.6 28.8	214 31.2 14.7	230 27.2 13.2	146 12.6 37.4	34 37.9 132 4 55.9 +128						
5	25 29.6	224 16.2 .. 27.6	229 32.2 .. 14.1	245 29.2 .. 13.0	161 14.9 .. 37.4	49 10.1 131 .. 4 43.1 +127						
6	40 32.1	239 15.7 26.5	244 33.1 13.6	260 31.1 12.8	176 17.2 37.5	63 42.2 132 4 30.4 +129						
7	55 34.5	254 15.3 25.3	259 34.1 13.0	275 33.0 12.7	191 19.5 37.5	78 14.4 131 4 17.5 +128						
8	70 37.0	269 14.8 + 9 24.1	274 35.0 +11 12.4	290 35.0 +16 12.5	206 21.8 -14 37.6	92 46.5 131 - 4 04.7 +129						
9	85 39.5	284 14.4 23.0	289 36.0 11.8	305 36.9 12.4	221 24.1 37.6	107 18.6 131 3 51.8 +129						
10	100 41.9	299 13.9 21.8	304 36.9 11.2	320 38.8 12.2	236 26.4 37.7	121 50.7 131 3 38.9 +129						
11	115 44.4	314 13.5 .. 20.7	319 37.9 .. 10.7	335 40.8 .. 12.1	251 28.7 .. 37.8	136 22.8 131 .. 3 26.0 +130						
12	130 46.8	329 13.0 19.5	334 38.9 10.1	350 42.7 11.9	266 31.0 37.8	150 54.9 131 3 13.0 +130						
13	145 49.3	344 12.6 18.3	349 39.8 09.5	5 44.7 11.7	281 33.3 37.9	165 27.0 130 3 00.0 +130						
14	160 51.8	359 12.1 + 9 17.2	4 40.8 +11 08.9	20 46.6 +16 11.6	296 35.6 -14 37.9	179 59.0 131 - 2 47.0 +130						
15	175 54.2	14 11.7 16.0	19 41.7 08.3	35 48.5 11.4	311 37.9 38.0	194 31.1 130 2 34.0 +131						
16	190 56.7	29 11.2 14.9	34 42.7 07.8	50 50.5 11.3	326 40.2 38.0	209 03.1 130 2 20.9 +131						
17	205 59.2	44 10.8 .. 13.7	49 43.6 .. 07.2	65 52.4 .. 11.1	341 42.5 .. 38.1	223 35.1 130 .. 2 07.8 +131						
18	221 01.6	59 10.3 12.5	64 44.6 06.6	80 54.3 11.0	356 44.8 38.2	238 07.1 130 1 54.7 +131						
19	236 04.1	74 09.9 11.4	79 45.5 06.0	95 56.3 10.8	11 47.1 38.2	252 39.1 130 1 41.6 +131						
20	251 06.6	89 09.4 + 9 10.2	94 46.5 +11 05.4	110 58.2 +16 10.6	26 49.4 -14 38.3	267 11.1 129 - 1 28.5 +132						
21	266 09.0	104 09.0 09.1	109 47.5 04.8	126 00.2 10.5	41 51.7 38.3	281 43.0 130 1 15.3 +131						
22	281 11.5	119 08.6 07.9	124 48.4 04.3	141 02.1 10.3	56 54.0 38.4	296 15.0 129 1 02.2 +132						
23	296 14.0	134 08.1 .. 06.7	139 49.4 .. 03.7	156 04.0 .. 10.2	71 56.3 .. 38.4	310 46.9 129 .. 0 49.0 +132						
24	311 16.4	149 07.7 05.6	154 50.3 03.1	171 06.0 10.0	86 58.6 38.5	325 18.8 128 0 35.8 +132						
25	326 18.9	164 07.2 04.4	169 51.3 02.5	186 07.9 09.9	102 00.9 38.6	339 50.6 129 0 22.6 +133						
3	341 21.3	179 06.8 + 9 03.2	184 52.2 +11 01.9	201 09.9 +16 09.7	117 03.2 -14 38.6	354 22.5 128 - 0 09.3 +132						
4	356 23.8	194 06.3 02.1	199 53.2 01.3	216 11.8 09.5	132 05.5 38.7	8 54.3 128 + 0 03.9 +132						
5	11 26.3	209 05.9 9 00.9	214 54.1 00.8	231 13.7 09.4	147 07.8 38.7	23 26.1 127 0 17.1 +133						
6	26 28.7	224 05.4 .. 8 59.7	229 55.1 .. 11 00.2	246 15.7 .. 09.2	162 10.1 .. 38.8	37 57.8 128 .. 0 30.4 +132						
7	41 31.2	239 05.0 58.6	244 56.1 10 59.6	261 17.6 09.1	177 12.4 38.9	52 29.6 127 0 43.6 +133						
8	56 33.7	254 04.5 57.4	259 57.0 59.0	276 19.5 08.9	192 14.7 38.9	67 01.3 127 0 56.9 +133						
9	71 36.1	269 04.1 + 8 56.2	274 58.0 +10 58.4	291 21.5 +16 08.8	207 17.0 -14 39.0	81 33.0 127 + 1 10.2 +132						
10	86 38.6	284 03.7 55.1	289 58.9 57.8	306 23.4 08.6	222 19.2 39.0	96 04.7 126 1 23.4 +133						
11	101 41.1	299 03.2 53.9	304 59.9 57.3	321 25.4 08.4	237 21.5 39.1	110 36.3 126 1 36.7 +133						
12	116 43.5	314 02.8 .. 52.7	320 00.8 .. 56.7	336 27.3 .. 08.3	252 23.8 .. 39.1	125 07.9 126 .. 1 50.0 +133						
13	131 46.0	329 02.3 51.5	335 01.8 56.1	351 29.2 08.1	267 26.1 39.2	139 39.5 125 2 03.3 +132						
14	146 48.5	344 01.9 50.4	350 02.8 55.5	6 31.2 08.0	282 28.4 39.3	154 11.0 126 2 16.5 +133						
15	161 50.9	359 01.4 + 8 49.2	5 03.7 +10 54.9	21 33.1 +16 07.8	297 30.7 -14 39.3	168 42.6 124 + 2 29.8 +133						
16	176 53.4	14 01.0 48.0	20 04.7 54.3	36 35.1 07.7	312 33.0 39.4	183 14.0 125 2 43.1 +132						
17	191 55.8	29 00.6 46.9	35 05.6 53.7	51 37.0 07.5	327 35.3 39.4	197 45.5 124 2 56.3 +133						
18	206 58.3	44 00.1 .. 45.7	50 06.6 .. 53.2	66 38.9 .. 07.3	342 37.6 .. 39.5	212 16.9 124 .. 3 09.6 +133						
19	222 00.8	58 59.7 44.5	65 07.5 52.6	81 40.9 07.2	357 39.9 39.6	226 48.3 123 3 22.9 +132						
20	237 03.2	73 59.2 43.3	80 08.5 52.0	96 42.8 07.0	12 42.2 39.6	241 19.6 123 3 36.1 +132						
21	252 05.7	88 58.8 + 8 42.2	95 09.5 +10 51.4	111 44.8 +16 06.9	27 44.5 -14 39.7	255 50.9 123 + 3 49.3 +133						
22	267 08.2	103 58.4 41.0	110 10.4 50.8	126 46.7 06.7	42 46.8 39.7	270 22.2 122 4 02.6 +132						
23	282 10.6	118 57.9 39.8	125 11.4 50.2	141 48.6 06.6	57 49.1 39.8	284 53.4 122 4 15.8 +132						
24	297 13.1	133 57.5 .. 38.7	140 12.3 .. 49.7	156 50.6 .. 06.4	72 51.4 .. 39.8	299 24.6 122 .. 4 29.0 +132						
25	312 15.6	148 57.0 37.5	155 13.3 49.1	171 52.5 06.2	87 53.7 39.9	313 55.8 121 4 42.2 +132						
26	327 18.0	163 56.6 36.3	170 14.3 48.5	186 54.5 06.1	102 56.0 40.0	328 26.9 121 4 55.4 +131						
27	342 20.5	178 56.2 + 8 35.1	185 15.2 +10 47.9	201 56.4 +16 05.9	117 58.2 -14 40.0	342 58.0 120 + 5 08.5 +132						
code	-	- 4 - 12	+ 9 - 6	+ 19 - 2	+ 23 - 1							

250030 O - 54 - 12

G M T	VENUS - 3.5		MARS 2.0		JUPITER - 1.3		SATURN 0.8		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
4	0	342 20.5	178 56.2 + 8	35.1	185 15.2 +10	47.9	201 56.4 +16	05.9	117 58.2 -14	40.0	342 58.0 120 +	5 08.5 +132
1	357 22.9	193 55.7	34.0	200 16.2	47.3	216 58.3	05.8	133 00.5	40.1	357 29.0 120	5 21.7 +131	
2	12 25.4	208 55.3	32.8	215 17.1	46.7	232 00.3	05.6	148 02.8	40.1	12 00.0 119	5 34.8 +131	
3	27 27.9	223 54.8	31.6	230 18.1	46.1	247 02.2	05.5	163 05.1	40.2	26 30.9 119	5 47.9 +131	
4	42 30.3	238 54.4	30.4	245 19.1	45.5	262 04.2	05.3	178 07.4	40.3	41 01.8 119	6 01.0 +130	
5	57 32.8	253 54.0	29.2	260 20.0	45.0	277 06.1	05.1	193 09.7	40.3	55 32.7 118	6 14.0 +130	
6	72 35.3	268 53.5	+ 8 28.1	275 21.0	+10 44.4	292 08.0	+16 05.0	208 12.0	-14 40.4	70 03.5 117 +	6 27.0 +131	
7	87 37.7	283 53.1	26.9	290 21.9	43.8	307 10.0	04.8	223 14.3	40.4	84 34.2 117	6 40.1 +129	
8	102 40.2	298 52.7	25.7	305 22.9	43.2	322 11.9	04.7	238 16.6	40.5	99 04.9 117	6 53.0 +130	
9	117 42.7	313 52.2	24.5	320 23.9	42.6	337 13.9	04.5	253 18.9	40.6	113 35.6 116 +	7 06.0 +129	
10	132 45.1	328 51.8	23.3	335 24.8	42.0	352 15.8	04.4	268 21.2	40.6	128 06.2 116	7 18.9 +129	
11	147 47.6	343 51.3	22.2	350 25.8	41.4	7 17.7	04.2	283 23.5	40.7	142 36.8 115	7 31.8 +129	
12	162 50.1	358 50.9	+ 8 21.0	5 26.7 +10	40.9	22 19.7 +16	04.0	298 25.8	-14 40.7	157 07.3 115 +	7 44.7 +128	
13	177 52.5	13 50.5	19.8	20 27.7	40.3	37 21.6	03.9	313 28.0	40.8	171 37.8 114	7 57.5 +128	
14	192 55.0	28 50.0	18.6	35 28.7	39.7	52 23.6	03.7	328 30.3	40.8	186 08.2 113	8 10.3 +128	
15	207 57.4	43 49.6	17.4	50 29.6	39.1	67 25.5	03.6	343 32.6	40.9	200 38.5 113	8 23.1 +127	
16	222 59.9	58 49.2	16.3	65 30.6	38.5	82 27.5	03.4	358 34.9	41.0	215 08.8 113	8 35.8 +127	
17	238 02.4	73 48.7	15.1	80 31.5	37.9	97 29.4	03.3	13 37.2	41.0	229 39.1 112	8 48.5 +126	
18	253 04.8	88 48.3	+ 8 13.9	95 32.5 +10	37.3	112 31.3 +16	03.1	28 39.5	-14 41.1	244 09.3 111 +	9 01.1 +127	
19	268 07.3	103 47.9	12.7	110 33.5	36.7	127 33.3	02.9	43 41.8	41.1	258 39.4 111	9 13.8 +125	
20	283 09.8	118 47.4	11.5	125 34.4	36.1	142 35.2	02.8	58 44.1	41.2	273 09.5 110	9 26.3 +125	
21	298 12.2	133 47.0	10.3	140 35.4	35.6	157 37.2	02.6	73 46.4	41.3	287 39.5 110	9 38.8 +125	
22	313 14.7	148 46.6	09.2	155 36.3	35.0	172 39.1	02.5	88 48.7	41.3	302 09.5 109	9 51.3 +125	
23	328 17.2	163 46.1	08.0	170 37.3	34.4	187 41.0	02.3	103 50.9	41.4	316 39.4 109	10 03.8 +124	
5	0	343 19.6	178 45.7 + 8	06.8	185 38.3 +10	33.8	202 43.0 +16	02.2	118 53.2 -14	41.4	331 09.3 108 +10	16.2 +123
1	358 22.1	193 45.3	05.6	200 39.2	33.2	217 44.9	02.0	133 55.5	41.5	345 39.1 107	10 28.5 +123	
2	13 24.5	208 44.8	04.4	215 40.2	32.6	232 46.9	01.8	148 57.8	41.6	0 08.0 107	10 40.8 +122	
3	28 27.0	223 44.4	03.2	230 41.1	32.0	247 48.8	01.7	164 00.1	41.6	14 38.5 106	10 53.0 +122	
4	43 29.5	238 44.0	02.0	245 42.1	31.4	262 50.8	01.5	179 02.4	41.7	29 08.1 105	11 05.2 +121	
5	58 31.9	253 43.6	8 00.9	260 43.1	30.8	277 52.7	01.4	194 04.7	41.7	43 37.6 105	11 17.3 +121	
6	73 34.4	268 43.1	+ 7 59.7	275 44.0 +10	30.3	292 54.6 +16	01.2	209 07.0	-14 41.8	58 07.1 104	+11 29.4 +120	
7	88 36.9	283 42.7	58.5	290 45.0	29.7	307 56.6	01.1	224 09.3	41.9	72 36.5 104	11 41.4 +120	
8	103 39.3	298 42.3	57.3	305 45.9	29.1	322 58.5	00.9	239 11.5	41.9	87 05.9 103	11 53.4 +119	
9	118 41.8	313 41.8	56.1	320 46.9	28.5	338 00.5	00.7	254 13.8	42.0	101 35.2 102	12 05.3 +118	
10	133 44.3	328 41.4	54.9	335 47.9	27.9	353 02.4	00.6	269 16.1	42.0	116 04.4 102	12 17.1 +118	
11	148 46.7	343 41.0	53.7	350 48.8	27.3	8 04.4	00.4	284 18.4	42.1	130 33.6 101	12 28.9 +117	
12	163 49.2	358 40.5	+ 7 52.5	5 49.8 +10	26.7	23 06.3 +16	00.3	299 20.7	-14 42.2	145 02.7 100	+12 40.6 +117	
13	178 51.7	13 40.1	51.3	20 50.8	26.1	38 08.2	00.1	314 23.0	42.2	159 31.7 100	12 52.3 +116	
14	193 54.1	28 39.7	50.2	35 51.7	25.5	53 10.2	16 00.0	329 25.3	42.3	174 00.7 99	13 03.9 +115	
15	208 56.6	43 39.3	49.0	50 52.7	24.9	68 12.1	-15 59.8	344 27.6	42.3	188 29.6 99	-13 15.4 +115	
16	223 59.0	58 38.8	47.8	65 53.6	24.4	83 14.1	59.6	359 29.9	42.4	202 58.5 97	13 26.9 +113	
17	239 01.5	73 38.4	46.6	80 54.6	23.8	98 16.0	59.5	14 32.1	42.5	217 27.2 97	13 38.2 +114	
18	254 04.0	88 38.0	+ 7 45.4	95 55.6 +10	23.2	113 18.0 +15	59.3	29 34.4	-14 42.5	231 55.9 96	+13 49.6 +112	
19	269 06.4	103 37.6	44.2	110 56.5	22.6	128 19.9	59.2	44 36.7	42.6	246 24.5 96	14 00.8 +112	
20	284 08.9	118 37.1	43.0	125 57.5	22.0	143 21.9	59.0	59 39.0	42.6	260 53.1 95	14 12.0 +111	
21	299 11.4	133 36.7	41.8	140 58.5	21.4	158 23.8	58.9	74 41.3	42.7	275 21.6 94	-14 23.1 +110	
22	314 13.8	148 36.3	40.6	155 59.4	20.8	173 25.7	58.7	89 43.6	42.8	289 50.0 94	14 34.1 +109	
23	329 16.3	163 35.8	39.4	171 00.4	20.2	188 27.7	58.5	104 45.9	42.8	304 18.4 92	14 45.0 +109	
6	0	344 18.8	178 35.4 + 7	38.2	186 01.3 +10	19.6	203 29.6 +15	58.4	119 48.1 -14	42.9	318 46.6 93 +14	55.9 +107
1	359 21.2	193 35.0	37.0	201 02.3	19.0	218 31.6	58.2	134 50.4	42.9	333 14.9 91	15 06.6 +107	
2	14 23.7	208 34.6	35.8	216 03.3	18.4	233 33.5	58.1	149 52.7	43.0	347 43.0 91	15 17.3 +106	
3	29 26.1	223 34.1	34.6	231 04.2	17.9	248 35.5	57.9	164 55.0	43.1	2 11.1 90	-15 27.9 +105	
4	44 28.6	238 33.7	33.4	246 05.2	17.3	263 37.4	57.8	179 57.3	43.1	16 39.1 89	15 38.4 +105	
5	59 31.1	253 33.3	32.2	261 06.2	16.7	278 39.4	57.6	194 59.6	43.2	31 07.0 88	15 48.9 +103	
6	74 33.5	268 32.9	+ 7 31.0	276 07.1 +10	16.1	293 41.3 +15	57.5	210 01.9	-14 43.2	45 34.8 88	+15 59.2 +103	
7	89 36.0	283 32.5	29.9	291 08.1	15.5	308 43.2	57.3	225 04.1	43.3	60 02.6 87	16 09.5 +102	
8	104 38.5	298 32.0	28.7	306 09.0	14.9	323 45.2	57.1	240 06.4	43.4	74 30.3 87	16 19.7 +100	
9	119 40.9	313 31.6	27.5	321 10.0	14.3	338 47.1	57.0	255 08.7	43.4	88 58.0 85	-16 29.7 +100	
10	134 43.4	328 31.2	26.3	336 11.0	13.7	353 49.1	56.8	270 11.0	43.5	103 25.5 85	16 39.7 + 99	
11	149 45.9	343 30.8	25.1	351 11.9	13.1	8 51.0	56.7	285 13.3	43.5	117 53.0 84	16 49.6 + 98	
12	164 48.3	358 30.3	+ 7 23.9	6 12.9 +10	12.5	23 53.0 +15	56.5	300 15.6	-14 43.6	132 20.4 84	+16 59.4 + 97	
13	179 50.8	13 29.9	22.7	21 13.9	11.9	38 54.9	56.4	315 17.9	43.7	146 47.8 83	17 09.1 + 96	
14	194 53.3	28 29.5	21.5	36 14.8	11.3	53 56.9	56.2	330 20.1	43.7	161 15.1 82	17 18.7 + 95	
15	209 55.7	43 29.1	20.3	51 15.8	10.7	68 58.8	56.0	345 22.4	43.8	175 42.3 81	-17 28.2 + 94	
16	224 58.2	58 28.6	19.1	66 16.8	10.2	84 00.7	55.9	0 24.7	43.8	190 09.4 80	17 37.6 + 93	
17	240 00.6	73 28.2	17.9	81 17.7	09.6	99 02.7	55.7	15 27.0	43.9	204 36.4 80	17 46.9 + 92	
18	255 03.1	88 27.8	+ 7 16.7	96 18.7 +10	09.0	114 04.6 +15	55.6	30 29.3	-14 44.0	219 03.4 79	+17 56.1 + 91	
19	270 05.6	103 27.4	15.5	111 19.6	08.4	129 06.6	55.4	45 31.6	44.0	233 30.3 79	18 05.2 + 89	
20	285 08.0	118 27.0	14.3	126 20.6	07.8	144 08.5	55.3	60 33.8	44.1	247 57.2 78	18 14.1 + 89	
21	300 10.5	133 26.5	13.1	141 21.6	07.2	159 10.5	55.1	75 36.1	44.2	262 24.0 77	-18 23.0 + 88	
22	315 13.0	148 26.1	11.8	156 22.5	06.6	174 12.4	54.9	90 38.4	44.2	276 50.7 76	18 31.8 + 86	
23	330 15.4	163 25.7	10.6	171 23.5	06.0	189 14.4	54.8	105 40.7	44.3	291 17.3 75	18 40.4 + 86	
24	345 17.9	178 25.3	+ 7 09.4	186 24.5 +10	05.4	204 16.3 +15	54.6	120 43.0	-14 44.3	305 43.8 75	+18 49.0 + 84	
code	—	- 4	- 12	+ 10	- 6	+ 19	- 2	+ 23	0			

G M T	SUN			STARS			Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.	No.	Name	SHA	Dec.				4	5	6	7	Alt.	Sun's Low'r Limb	Venus	Mars		
h	°	'	°	°	'	°	N	h	m	h	m	h	m	h	m	°	'	'	'
4	180	09.5	+ 7 33.5	7	Acamar	315 50.9	-40 28.5	72	4 17	///	17 49	17 19	16 14	□		Alt.			
1	195	09.7	32.6	5	Achernar	335 58.4	-57 27.3	70	4 28	///	18 02	17 45	17 18	□					
2	210	09.9	31.7	30	Acrux	173 58.5	-62 51.4	68	4 38	///	18 12	18 04	17 53	17 35					
3	225	10.1	30.7	19	Adhara	255 46.7	-28 54.4	66	4 45	///	18 21	18 20	18 19	18 22					
4	240	10.3	29.8	10	Aldebaran	291 39.1	+16 25.4	64	4 52	0 55	18 29	18 33	18 40	18 53	0				
5	255	10.5	28.9					62	4 58	1 41	18 35	18 44	18 56	19 16	30	0.2	0.1	0.1	
6	270	10.8	+ 7 28.0	32	Alioth	166 59.0	+56 12.1	60	5 02	2 08	18 41	18 53	19 10	19 35	45	0.2	0.1	0.0	
7	285	11.0	27.1	34	Alkaid	153 33.2	+49 32.2	58	5 07	2 30	18 46	19 01	19 22	19 50	60	0.2	0.1	0.0	
8	300	11.2	26.1	55	Al Na'ir	28 37.5	-47 10.4	56	5 10	2 46	18 51	19 09	19 32	20 04	75	0.2	0.0	0.0	
9	315	11.4	25.2	15	Alnilam	276 30.4	- 1 13.6	54	5 14	2 59	18 55	19 15	19 41	20 15	90	0.2	0.0	0.0	
10	330	11.6	24.3	25	Alphard	218 38.9	- 8 27.9	52	5 17	3 10	18 58	19 21	19 49	20 25					
11	345	11.8	23.4					50	5 20	3 20	19 02	19 27	19 57	20 34					
12	0	12.0	+ 7 22.5	41	Alphecca	126 47.7	+26 52.0	45	5 26	3 40	19 09	19 38	20 12	20 54					
13	15	12.2	21.5	1	Alpheratz	358 28.0	+28 50.9	40	5 31	3 56	19 15	19 48	20 25	21 10					
14	30	12.4	20.6	51	Altair	62 50.2	+ 8 45.2	35	5 35	4 07	19 20	19 56	20 37	21 23					
15	45	12.6	19.7	2	Ankaa	353 57.9	-42 32.5	30	5 39	4 16	19 25	20 04	20 46	21 35					
16	60	12.8	18.8	42	Antares	113 19.4	-26 20.2	20	5 45	4 30	19 33	20 16	21 03	21 55					
17	75	13.0	17.9					10	5 51	4 40	19 41	20 28	21 18	22 13					
18	90	13.2	+ 7 16.9	37	Arcturus	146 35.4	+19 24.9	0	5 56	4 47	19 48	20 38	21 32	22 29					
19	105	13.4	16.0	43	Atria	109 00.1	-68 57.2	10	6 01	4 51	19 55	20 49	21 46	22 46	12	16.9	17.4	17.8	
20	120	13.6	15.1	22	Avior	234 36.3	-59 21.8	20	6 06	4 54	20 02	21 01	22 01	23 03	16	16.9	17.4	17.8	
21	135	13.8	14.2	13	Bellatrix	279 18.5	+ 6 18.8	30	6 12	4 53	20 11	21 14	22 19	23 24	20	16.9	17.4	17.7	
22	150	14.0	13.3	16	Betelge'se	271 48.2	+ 7 24.1	35	6 15	4 52	20 16	21 22	22 29	23 36	24	16.8	17.3	17.7	
23	165	14.2	12.3					40	6 18	4 50	20 21	21 31	22 41	23 50	28	16.8	17.3	17.6	
				17	Canopus	264 15.6	-52 40.0	45	6 23	4 47	20 28	21 41	22 55	24 07	32	16.8	17.2	17.5	
				12	Capella	281 38.5	+45 57.2	50	6 28	4 42	20 36	21 53	23 11	24 27	36	16.7	17.1	17.5	
				53	Deneb	50 00.6	+45 07.6	52	6 30	4 40	20 40	21 59	23 20	24 37	40	16.7	17.1	17.4	
				28	Denebola	183 18.1	+14 49.2	54	6 33	4 37	20 44	22 06	23 28	24 48	44	16.6	17.0	17.3	
				4	Diphda	349 39.0	-18 13.5	56	6 35	4 34	20 48	22 13	23 38	25 01	48	16.6	16.9	17.2	
								58	6 38	4 30	20 53	22 21	23 50	25 15	52	16.5	16.8	17.1	
								60	6 42	4 26	20 59	22 31	24 03	0 03	56	16.4	16.8	17.0	
								S							60	16.4	16.7	16.9	
								Lat.	Sunset	Twlt. ends	Moonset								
				N	°	h	m	h	m	h	m	h	m	h	m				
				72	19 38	///	8 53	11 08	14 04	□									
				70	19 26	///	8 43	10 44	13 02	□									
				68	19 18	///	8 34	10 26	12 27	14 42									
				66	19 10	///	8 27	10 12	12 02	13 56									
				64	19 04	22 50	8 21	10 00	11 43	13 26									
				62	18 59	22 10	8 16	9 50	11 27	13 03									
				60	18 54	21 43	8 12	9 42	11 14	12 45									
				58	18 50	21 24	8 08	9 35	11 03	12 30									
				56	18 46	21 08	8 04	9 28	10 53	12 17									
				54	18 43	20 55	8 01	9 22	10 45	12 06									
				52	18 40	20 44	7 58	9 17	10 37	11 56									
				50	18 37	20 34	7 56	9 13	10 30	11 47									
				45	18 31	20 15	7 50	9 02	10 16	11 29									
				40	18 26	20 00	7 46	8 54	10 04	11 14									
				35	18 22	19 49	7 42	8 47	9 54	11 01									
				30	18 19	19 41	7 38	8 41	9 45	10 50									
				20	18 12	19 26	7 32	8 30	9 29	10 31									
				10	18 07	19 18	7 27	8 20	9 16	10 14									
				0	18 02	19 11	7 22	8 11	9 04	9 59									
				10	17 57	19 07	7 17	8 03	8 51	9 44									
				20	17 52	19 05	7 12	7 53	8 38	9 27									
				30	17 47	19 07	7 06	7 43	8 23	9 08									
				35	17 44	19 08	7 02	7 36	8 14	8 57									
				40	17 40	19 10	6 59	7 29	8 04	8 45									
				45	17 36	19 14	6 54	7 21	7 53	8 30									
				50	17 31	19 19	6 49	7 12	7 39	8 12									
				52	17 29	19 21	6 46	7 07	7 32	8 04									
				54	17 26	19 24	6 44	7 02	7 25	7 54									
				56	17 24	19 28	6 41	6 57	7 17	7 44									
				58	17 21	19 32	6 37	6 51	7 08	7 32									
				60	17 17	19 36	6 34	6 44	6 58	7 18									
				S															
				G M T	Equation of Time (App.—Mean)			GMT of Transit Meridian of Greenwich											
					4	5	6												
				h	m	s	m	s	m	s	DAY	Moon	Venus	Mars	Jupiter	Saturn			
				0	+ 0 37.7	+ 0 57.4	+ 1 17.3				h	m	h	m	h	m	h	m	
				6	+ 0 42.6	+ 1 02.3	+ 1 22.3				4	1 10	12 05	11 38	10 31	16 06			
				12	+ 0 47.5	+ 1 07.3	+ 1 27.3				5	1 59	12 05	11 37	10 28	16 02			
				18	+ 0 52.4	+ 1 12.3	+ 1 32.3				6	2 51	12 06	11 35	10 25	15 58			
				24	+ 0 57.4	+ 1 17.3	+ 1 37.4				7	3 46	12 07	11 34	10 22	15 55			
				24	180 24.5	+ 6 26.9													

G M T	VENUS - 3.5		MARS 2.0		JUPITER - 1.3		SATURN 0.8		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
70	345 17.9	178 25.3 + 7 09.4	186 24.5 +10 05.4	204 16.3 +15 54.6	120 43.0 -14 44.3	305 43.8 75 +18 49.0 + 84						
1	0 20.4	193 24.9 08.2	201 25.4 04.8	219 18.3 54.5	135 45.3 44.4	320 10.3 74 18 57.4 + 83						
2	15 22.8	208 24.4 07.0	216 26.4 04.2	234 20.2 54.3	150 47.6 44.5	334 36.7 74 19 05.7 + 82						
3	30 25.3	223 24.0 .. 05.8	231 27.4 .. 03.6	249 22.2 .. 54.2	165 49.8 .. 44.5	349 03.1 73 19 13.9 + 81						
4	45 27.8	238 23.6 04.6	246 28.3 03.0	264 24.1 54.0	180 52.1 44.6	3 29.4 72 19 22.0 + 80						
5	60 30.2	253 23.2 03.4	261 29.3 02.4	279 26.0 53.8	195 54.4 44.6	17 55.6 71 19 30.0 + 78						
6	75 32.7	268 22.8 + 7 02.2	276 30.3 +10 01.8	294 28.0 +15 53.7	210 56.7 -14 44.7	32 21.7 71 +19 37.8 + 78						
7	90 35.1	283 22.4 7 01.0	291 31.2 01.2	309 29.9 53.5	225 59.0 44.8	46 47.8 70 19 45.6 + 76						
8	105 37.6	298 21.9 6 59.8	306 32.2 00.7	324 31.9 53.4	241 01.3 44.8	61 13.8 69 19 53.2 + 75						
9	120 40.1	313 21.5 .. 58.6	321 33.2 10 00.1	339 33.8 .. 53.2	256 03.5 .. 44.9	75 39.7 69 20 00.7 + 73						
10	135 42.5	328 21.1 57.4	336 34.1 9 59.5	354 35.8 53.1	271 05.8 44.9	90 05.6 68 20 08.0 + 71						
11	150 45.0	343 20.7 56.2	351 35.1 58.9	9 37.7 52.9	286 08.1 45.0	104 31.4 68 20 15.3 + 71						
12	165 47.5	358 20.3 + 6 55.0	6 36.1 + 9 58.3	24 39.7 +15 52.7	301 10.4 -14 45.1	118 57.2 66 +20 22.4 + 69						
13	180 49.9	13 19.9 53.8	21 37.0 57.7	39 41.6 52.6	316 12.7 45.1	133 22.8 67 20 29.3 + 69						
14	195 52.4	28 19.4 52.6	36 38.0 57.1	54 43.6 52.4	331 14.9 45.2	147 48.5 65 20 36.2 + 67						
15	210 54.9	43 19.0 .. 51.4	51 39.0 .. 56.5	69 45.5 .. 52.3	346 17.2 .. 45.3	162 14.0 65 20 42.9 + 66						
16	225 57.3	58 18.6 50.1	66 39.9 55.9	84 47.5 52.1	1 19.5 45.3	176 39.5 64 20 49.5 + 65						
17	240 59.8	73 18.2 48.9	81 40.9 55.3	99 49.4 52.0	16 21.8 45.4	191 04.9 64 20 56.0 + 63						
18	256 02.2	88 17.8 + 6 47.7	96 41.9 + 9 54.7	114 51.4 +15 51.8	31 24.1 -14 45.4	205 30.3 63 +21 02.3 + 62						
19	271 04.7	103 17.4 46.5	111 42.8 54.1	129 53.3 51.6	46 26.3 45.5	219 55.6 62 21 08.5 + 61						
20	286 07.2	118 16.9 45.3	126 43.8 53.5	144 55.3 51.5	61 28.6 45.6	234 20.8 62 21 14.6 + 59						
21	301 09.6	133 16.5 .. 44.1	141 44.8 .. 52.9	159 57.2 .. 51.3	76 30.9 .. 45.6	248 46.0 62 21 20.5 + 58						
22	316 12.1	148 16.1 42.9	156 45.7 52.3	174 59.1 51.2	91 33.2 45.7	263 11.2 60 21 26.3 + 57						
23	331 14.6	163 15.7 41.7	171 46.7 51.7	190 01.1 51.0	106 35.5 45.7	277 36.2 61 21 32.0 + 55						
80	346 17.0	178 15.3 + 6 40.5	186 47.7 + 9 51.1	205 03.0 +15 50.9	121 37.8 -14 45.8	292 01.3 59 +21 37.5 + 54						
1	1 19.5	193 14.9 39.3	201 48.6 50.5	220 05.0 50.7	136 40.0 45.9	306 26.2 59 21 42.9 + 52						
2	16 22.0	208 14.5 38.0	216 49.6 49.9	235 06.9 50.6	151 42.3 45.9	320 51.1 59 21 48.1 + 51						
3	31 24.4	223 14.1 .. 36.8	231 50.6 .. 49.3	250 08.9 .. 50.4	166 44.6 .. 46.0	335 16.0 58 21 53.2 + 50						
4	46 26.9	238 13.6 35.6	246 51.5 48.7	265 10.8 50.2	181 46.9 46.1	349 40.8 58 21 58.2 + 48						
5	61 29.4	253 13.2 34.4	261 52.5 48.1	280 12.8 50.1	196 49.1 46.1	4 05.6 57 22 03.0 + 47						
6	76 31.8	268 12.8 + 6 33.2	276 53.5 + 9 47.5	295 14.7 +15 49.9	211 51.4 -14 46.2	18 30.3 56 +22 07.7 + 45						
7	91 34.3	283 12.4 32.0	291 54.4 46.9	310 16.7 49.8	226 53.7 46.2	32 54.9 57 22 12.2 + 44						
8	106 36.7	298 12.0 30.8	306 55.4 46.3	325 18.6 49.6	241 56.0 46.3	47 19.6 55 22 16.6 + 42						
9	121 39.2	313 11.6 .. 29.5	321 56.4 .. 45.7	340 20.6 .. 49.5	256 58.3 .. 46.4	61 44.1 56 22 20.8 + 41						
10	136 41.7	328 11.2 28.3	336 57.3 45.1	355 22.5 49.3	272 00.5 46.4	76 08.7 55 22 24.9 + 40						
11	151 44.1	343 10.8 27.1	351 58.3 44.6	10 24.5 49.1	287 02.8 46.5	90 33.2 54 22 28.9 + 38						
12	166 46.6	358 10.3 + 6 25.9	6 59.3 + 9 44.0	25 26.4 +15 49.0	302 05.1 -14 46.5	104 57.6 54 +22 32.7 + 36						
13	181 49.1	13 09.9 24.7	22 00.2 43.4	40 28.4 48.8	317 07.4 46.6	119 22.0 54 22 36.3 + 35						
14	196 51.5	28 09.5 23.5	37 01.2 42.8	55 30.3 48.7	332 09.7 46.7	133 46.4 53 22 39.8 + 34						
15	211 54.0	43 09.1 .. 22.3	52 02.2 .. 42.2	70 32.3 .. 48.5	347 11.9 .. 46.7	148 10.7 53 22 43.2 + 32						
16	226 56.5	58 08.7 21.0	67 03.1 41.6	85 34.2 48.4	2 14.2 46.8	162 35.0 53 22 46.4 + 30						
17	241 58.9	73 08.3 19.8	82 04.1 41.0	100 36.2 48.2	17 16.5 46.9	176 59.3 52 22 49.4 + 29						
18	257 01.4	88 07.9 + 6 18.6	97 05.1 + 9 40.4	115 38.1 +15 48.0	32 18.8 -14 46.9	191 23.5 52 +22 52.3 + 27						
19	272 03.9	103 07.5 17.4	112 06.0 39.8	130 40.1 47.9	47 21.1 47.0	205 47.7 52 22 55.0 + 26						
20	287 06.3	118 07.1 16.2	127 07.0 39.2	145 42.0 47.7	62 23.3 47.0	220 11.9 51 22 57.6 + 25						
21	302 08.8	133 06.7 .. 14.9	142 08.0 .. 38.6	160 44.0 .. 47.6	77 25.6 .. 47.1	234 36.0 51 23 00.1 + 23						
22	317 11.2	148 06.2 13.7	157 08.9 38.0	175 45.9 47.4	92 27.9 47.2	249 00.1 51 23 02.4 + 21						
23	332 13.7	163 05.8 12.5	172 09.9 37.4	190 47.9 47.3	107 30.2 47.2	263 24.2 51 23 04.5 + 20						
90	347 16.2	178 05.4 + 6 11.3	187 10.9 + 9 36.8	205 49.8 +15 47.1	122 32.4 -14 47.3	277 48.3 50 +23 06.5 + 18						
1	2 18.6	193 05.0 10.1	202 11.9 36.2	220 51.8 46.9	137 34.7 47.4	292 12.3 51 23 08.3 + 16						
2	17 21.1	208 04.6 08.9	217 12.8 35.6	235 53.7 46.8	152 37.0 47.4	306 36.4 50 23 09.9 + 16						
3	32 23.6	223 04.2 .. 07.6	232 13.8 .. 35.0	250 55.7 .. 46.6	167 39.3 .. 47.5	321 00.4 49 23 11.5 + 13						
4	47 26.0	238 03.8 06.4	247 14.8 34.4	265 57.6 46.5	182 41.6 47.5	335 24.3 50 23 12.8 + 12						
5	62 28.5	253 03.4 05.2	262 15.7 33.8	280 59.6 46.3	197 43.8 47.6	349 48.3 50 23 14.0 + 11						
6	77 31.0	268 03.0 + 6 04.0	277 16.7 + 9 33.2	296 01.5 +15 46.2	212 46.1 -14 47.7	4 12.3 49 +23 15.1 + 8						
7	92 33.4	283 02.6 02.7	292 17.7 32.6	311 03.5 46.0	227 48.4 47.7	18 36.2 49 23 15.9 + 8						
8	107 35.9	298 02.2 01.5	307 18.6 32.0	326 05.4 45.9	242 50.7 47.8	33 00.1 50 23 16.7 + 5						
9	122 38.3	313 01.8 6 00.3	322 19.6 .. 31.4	341 07.4 .. 45.7	257 52.9 .. 47.9	47 24.1 49 23 17.2 + 5						
10	137 40.8	328 01.4 5 59.1	337 20.6 30.8	356 09.3 45.5	272 55.2 47.9	61 48.0 49 23 17.7 + 2						
11	152 43.3	343 01.0 57.9	352 21.5 30.2	11 11.3 45.4	287 57.5 48.0	76 11.9 49 23 17.9 + 1						
12	167 45.7	358 00.5 + 5 56.6	7 22.5 + 9 29.6	26 13.2 +15 45.2	302 59.8 -14 48.0	90 35.8 49 +23 18.0 0						
13	182 48.2	13 00.1 55.4	22 23.5 29.0	41 15.2 45.1	318 02.0 48.1	104 59.7 49 23 18.0 - 3						
14	197 50.7	27 59.7 54.2	37 24.5 28.4	56 17.1 44.9	333 04.3 48.2	119 23.6 49 23 17.7 - 3						
15	212 53.1	42 59.3 .. 53.0	52 25.4 .. 27.8	71 19.1 .. 44.8	348 06.6 .. 48.2	133 47.5 49 23 17.4 - 5						
16	227 55.6	57 58.9 51.7	67 26.4 27.2	86 21.0 44.6	3 08.9 48.3	148 11.4 49 23 16.9 - 7						
17	242 58.1	72 58.5 50.5	82 27.4 26.6	101 23.0 44.4	18 11.1 48.4	162 35.3 49 23 16.2 - 9						
18	258 00.5	87 58.1 + 5 49.3	97 28.3 + 9 26.0	116 24.9 +15 44.3	33 13.4 -14 48.4	176 59.2 49 +23 15.3 - 10						
19	273 03.0	102 57.7 48.1	112 29.3 25.4	131 26.9 44.1	48 15.7 48.5	191 23.1 50 23 14.3 - 11						
20	288 05.5	117 57.3 46.8	127 30.3 24.8	146 28.9 44.0	63 18.0 48.6	205 47.1 49 23 13.2 - 13						
21	303 07.9	132 56.9 .. 45.6	142 31.2 .. 24.2	161 30.8 .. 43.8	78 20.2 .. 48.6	220 11.0 50 23 11.9 - 15						
22	318 10.4	147 56.5 44.4	157 32.2 23.6	176 32.8 43.7	93 22.5 48.7	234 35.0 49 23 10.4 - 16						
23	333 12.8	162 56.1 43.2	172 33.2 23.0	191 34.7 43.5	108 24.8 48.7	248 58.9 50 23 08.8 - 18						
24	348 15.3	177 55.7 + 5 41.9	187 34.2 + 9 22.4	206 36.7 +15 43.4	123 27.1 -14 48.8	263 22.9 50 +23 07.0 - 19						
code	-	- 4 - 12	+ 9 - 6	+ 20 - 2	+ 23 - 1							

SUN			STARS				Lat.		Sunrise	Twilt.	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS										
G M T	GHA	Dec.	No.	Name	SHA	Dec.	N	h	m	h	m	7	8	9	10	Alt.	Sun's Low'r Limb	Venus	Mars						
h	°	'						h	m	h	m	h	h	h	h										
7	180 24.5	+ 6 26.9	7	Acamar	315 50.9	-40 28.5	72	4	31	////	□	□	□	□	□	Alt.									
1	195 24.7	26.0	5	Achernar	335 58.4	-57 27.3	70	4	41	////	□	□	□	□	□										
2	210 24.9	25.1	30	Acrux	173 58.5	-62 51.4	68	4	49	////	17	35	□	□	19 40										
3	225 25.1	24.1	19	Adhara	255 46.7	-28 54.4	66	4	55	////	18 22	18 34	19 22	21 02	21 02										
4	240 25.3	23.2	10	Aldebaran	291 39.0	+16 25.4	64	5	01	1 25	18 53	19 20	20 14	21 39	21 39	0									
5	255 25.5	22.3					62	5	05	1 59	19 16	19 50	20 46	22 06	22 06	30	0.2	0.1	0.1						
6	270 25.7	+ 6 21.3	32	Alioth	166 59.0	+56 12.1	60	5	09	2 22	19 35	20 13	21 10	22 26	22 26	45	0.2	0.1	0.0						
7	285 25.9	20.4	34	Alkaid	153 33.2	+49 32.2	58	5	13	2 40	19 50	20 31	21 29	22 43	22 43	60	0.2	0.1	0.0						
8	300 26.1	19.5	55	Al Na'ir	28 37.5	-47 10.4	56	5	16	2 54	20 04	20 47	21 45	22 58	22 58	75	0.2	0.0	0.0						
9	315 26.4	18.5	15	Alnilam	276 30.3	-1 13.6	54	5	19	3 07	20 15	21 00	21 59	23 10	23 10	90	0.2	0.0	0.0						
10	330 26.6	17.6	25	Alphard	218 38.9	-8 27.9	52	5	22	3 17	20 25	21 12	22 11	23 21	23 21										
11	345 26.8	16.7					50	5	24	3 27	20 34	21 22	22 21	23 30	23 30										
12	0 27.0	+ 6 15.7	41	Alphecca	126 47.8	+26 52.0	45	5	29	3 45	20 54	21 44	22 43	23 51	23 51										
13	15 27.2	14.8	1	Alpheratz	358 28.0	+28 50.9	40	5	34	3 59	21 10	22 01	23 01	24 07	24 07										
14	30 27.4	13.9	51	Altair	62 50.2	+8 45.2	35	5	37	4 09	21 23	22 16	23 16	24 21	24 21										
15	45 27.6	12.9	2	Ankaa	353 57.9	-42 32.5	30	5	40	4 19	21 35	22 29	23 29	24 33	24 33										
16	60 27.8	12.0	42	Antares	113 19.4	-26 20.2	20	5	46	4 31	21 55	22 51	23 51	24 53	24 53										
17	75 28.0	11.1					10	5	50	4 40	22 13	23 10	24 10	0 10	0 10										
18	90 28.3	+ 6 10.1	37	Arcturus	146 35.4	+19 24.9	0	5	55	4 46	22 29	23 28	24 28	0 28	0 28										
19	105 28.5	09.2	43	Atria	109 00.2	-68 57.2	10	5	59	4 49	22 46	23 46	24 46	0 46	0 46										
20	120 28.7	08.2	22	Avior	234 36.3	-59 21.8	20	6	03	4 51	23 03	24 05	0 05	1 06	1 06										
21	135 28.9	07.3	13	Bellatrix	279 18.5	+6 18.8	30	6	08	4 50	23 24	24 28	0 28	1 28	1 28										
22	150 29.1	06.4	16	Betelge'se	271 48.2	+7 24.1	35	6	10	4 48	23 36	24 41	0 41	1 41	1 41										
23	165 29.3	05.4					40	6	13	4 45	23 50	24 56	0 56	1 56	1 56										
			17	Canopus	264 15.6	-52 40.0	45	6	17	4 41	24 07	0 07	1 14	2 14	2 14										
8	180 29.5	+ 6 04.5	12	Capella	281 38.5	+45 57.2	50	6	21	4 35	24 27	0 27	1 36	2 36	2 36										
1	195 29.7	03.6	53	Deneb	50 00.6	+45 07.6	52	6	23	4 32	24 37	0 37	1 47	2 46	2 46										
2	210 30.0	02.6	28	Denebola	183 18.1	+14 49.2	54	6	25	4 30	24 48	0 48	1 59	2 58	2 58										
3	225 30.2	01.7	4	Diphda	349 39.0	-18 13.5	56	6	27	4 26	25 01	1 01	2 13	3 12	3 12										
4	240 30.4	6 00.8					58	6	30	4 22	25 15	1 15	2 30	3 28	3 28										
5	255 30.6	5 59.8	27	Dubhe	194 45.2	+61 59.4	60	6	32	4 16	0 03	1 32	2 49	3 47	3 47										
6	270 30.8	+ 5 58.9	14	Elnath	279 07.4	+28 34.3	5																		
7	285 31.0	57.9	47	Eltanin	91 06.1	+51 29.9		Lat.	Sunset	Twilt.	Moonset														
8	300 31.2	57.0	54	Enif	34 29.3	+9 40.5		N	h	m	h	m	7	8	9	10									
9	315 31.4	56.1	56	Fomalhaut	16 11.3	-29 51.2			h	m	h	m	h	h	h	h									
10	330 31.7	55.1					72	19	21	////	□	□	□	□	□										
11	345 31.9	54.2	31	Gacrux	172 49.8	-56 52.1	72	19	12	////	□	□	□	□	□										
12	0 32.1	+ 5 53.3	29	Gienah	176 37.2	-17 17.8	70	19	15	////	□	□	□	□	□										
13	15 32.3	52.3	35	Hadar	149 49.9	-60 09.8	68	19	05	////	14	42	□	□	18 53										
14	30 32.5	51.4	6	Hamal	328 49.4	+23 15.4	66	18	59	23 22	13 56	15 46	17 04	17 30	17 30										
15	45 32.7	50.4	48	Kaus Aust.	84 41.1	-34 24.5	64	18	53	22 21	13 26	15 01	16 12	16 52	16 52										
16	60 32.9	49.5					62	18	49	21 51	13 03	14 31	15 40	16 25	16 25										
17	75 33.2	48.6	40	Kochab	137 18.5	+74 20.4	60	18	45	21 28	12 45	14 09	15 16	16 04	16 04										
18	90 33.4	+ 5 47.6	57	Markab	14 21.1	+14 58.2	58	18	41	21 10	12 30	13 50	14 57	15 47	15 47										
19	105 33.6	46.7	8	Menkar	315 00.2	+3 55.2	56	18	38	20 57	12 17	13 35	14 41	15 32	15 32										
20	120 33.8	45.7	36	Menkent	148 59.0	-36 09.3	54	18	35	20 44	12 06	13 22	14 27	15 19	15 19										
21	135 34.0	44.8	24	Miapl'dus	221 49.9	-69 32.0	52	18	33	20 35	11 56	13 11	14 15	15 08	15 08										
22	150 34.2	43.9					50	18	31	20 26	11 47	13 00	14 05	14 58	14 58										
23	165 34.4	42.9	9	Mirfak	309 42.2	+49 42.2	45	18	26	20 09	11 29	12 39	13 43	14 38	14 38										
			50	Nunki	76 51.7	-26 21.2	40	18	22	19 55	11 14	12 22	13 25	14 21	14 21										
9	180 34.7	+ 5 42.0	52	Peacock	54 26.8	-56 52.8	35	18	18	19 44	11 01	12 07	13 10	14 06	14 06										
1	195 34.9	41.0	21	Pollux	244 20.8	+28 08.0	30	18	15	19 36	10 50	11 55	12 57	13 54	13 54										
2	210 35.1	40.1	20	Procyon	245 45.2	+5 20.4	20	18	10	19 24	10 31	11 33	12 34	13 33	13 33										
3	225 35.3	39.2					10	18	05	19 15	10 14	11 14	12 15	13 14	13 14										
4	240 35.5	38.2	46	R'alhague	96 46.6	+12 35.6	0	18	01	19 10	9 59	10 57	11 57	12 57	12 57										
5	255 35.7	37.3	26	Regulus	208 29.8	+12 11.1	10	17	57	19 07	9 44	10 40	11 39	12 39	12 39										
6	270 35.9	+ 5 36.3	11	Rigel	281 53.7	-8 14.9	20	17	53	19 06	9 27	10 21	11 19	12 21	12 21										
7	285 36.2	35.4	38	Rigel Kent.	140 51.4	-60 39.5	30	17	48	19 07	9 08	10 00	10 57	11 59	11 59										
8	300 36.4	34.5	44	Sabik	103 02.2	-15 40.3	35	17	46	19 10	8 57	9 47	10 44	11 46	11 46										
9	315 36.6	33.5					40	17	43	19 13	8 45	9 33	10 28	11 31	11 31										
10	330 36.8	32.6	3	Schedar	350 29.5	+56 17.8	45	17	40	19 18	8 30	9 15	10 10	11 14	11 14										
11	345 37.0	31.6	45	Shaula	97 20.6	-37 04.5	50	17	36	19 24	8 12	8 54	9 48	10 52	10 52										
12	0 37.2	+ 5 30.7	18	Sirius	259 12.0	-16 39.1	52	17	34	19 27	8 04	8 44	9 37	10 42	10 42										
13	15 37.4	29.8	33	Spica	159 17.2	-10 55.8	54	17	32	19 30	7 54	8 33	9 25	10 30	10 30										
14	30 37.7	28.8	23	Suhail	223 24.7	-43 15.1	56	17	30	19 34	7 44	8 20	9 11	10 17	10 17										
15	45 37.9	27.9					58	17	27	19 39	7 32	8 05	8 54	10 01	10 01										
16	60 38.1	26.9	49	Vega	81 08.1	+38 44.8	60	17	25	19 45	7 18	7 48	8 35	9 42	9 42										
17	75 38.3	26.0	39	Zub'g'bi	137 53.6	-15 51.6	5																		
18	90 38.5	+ 5 25.0																							
19	105 38.7	24.1	G M T	Equation of Time (App.—Mean)				GMT of Transit																	
20	120 39.0	23.2						Meridian of Greenwich																	
21	135 39.2	22.2																							
22	150 39.4	21.3	h	m	s	m	s	m	s	DAY	Moon	Venus	Mars	Jupiter	Saturn										
23	165 39.6	20.3	0	+ 1	37.4	+ 1	57.7	+ 2	18.2																
			6	+ 1	42.4	+ 2	02.8	+ 2	23.3	7	3	46	12	07	11	34	10	22	15	55					
			12	+ 1	47.5	+ 2	07.9	+ 2	28.5	8	4	43	12	07	11	32	10	19	15	51					
			18	+ 1	52.6	+ 2	13.0	+ 2	33.7	9	5	43	12	08	11	31	10	15	15	47					
			24	+ 1	57.7	+ 2	18.2	+ 2	38.8	10	6	43	12	09	11	29	10	12	15	44					
24	180 39.8	+ 5 19.4																		</					

G M T	Υ		VENUS - 3.5		MARS 2.0		JUPITER - 1.3		SATURN 0.8		MOON					
	GHA		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code		
10	h	o	o	o	o	o	o	o	o	o	o	o	o	o		
0	348 15.3	177 55.7	+ 5	41.9	187 34.2	+ 9	22.4	206 36.7	+15	43.4	123 27.1	-14	48.8	263 22.9	50 +23 07.0 - 19	
1	3 17.8	192 55.3		40.7	202 35.1		21.8	221 38.6		43.2	138 29.3		48.9	277 46.9	50 23 05.1 - 21	
2	18 20.2	207 54.9		39.5	217 36.1		21.2	236 40.6		43.0	153 31.6		48.9	292 10.9	50 23 03.0 - 23	
3	33 22.7	222 54.5	..	38.3	232 37.1	..	20.6	251 42.5	..	42.9	168 33.9	..	49.0	306 34.9	51 +23 00.7 - 24	
4	48 25.2	237 54.1		37.0	247 38.0		20.0	266 44.5		42.7	183 36.2		49.1	320 59.0	51 22 58.3 - 25	
5	63 27.6	252 53.7		35.8	262 39.0		19.4	281 46.4		42.6	198 38.4		49.1	335 23.1	51 22 55.8 - 27	
6	78 30.1	267 53.3	+ 5	34.6	277 40.0	+ 9	18.8	296 48.4	+15	42.4	213 40.7	-14	49.2	349 47.2	51 +22 53.1 - 29	
7	93 32.6	282 52.9		33.4	292 41.0		18.2	311 50.3		42.3	228 43.0		49.2	4 11.3	51 22 50.2 - 30	
8	108 35.0	297 52.5		32.1	307 41.9		17.6	326 52.3		42.1	243 45.3		49.3	18 35.4	52 22 47.2 - 32	
9	123 37.5	312 52.1	..	30.9	322 42.9	..	17.0	341 54.2	..	41.9	258 47.5	..	49.4	32 59.6	52 +22 44.0 - 33	
10	138 40.0	327 51.7		29.7	337 43.9		16.3	356 56.2		41.8	273 49.8		49.4	47 23.8	53 22 40.7 - 34	
11	153 42.4	342 51.3		28.4	352 44.8		15.7	11 58.1		41.6	288 52.1		49.5	61 48.1	53 22 37.3 - 37	
12	168 44.9	357 50.9	+ 5	27.2	7 45.8	+ 9	15.1	27 00.1	+15	41.5	303 54.3	-14	49.6	76 12.4	53 +22 33.6 - 37	
13	183 47.3	12 50.5		26.0	22 46.8		14.5	42 02.0		41.3	318 56.6		49.6	90 36.7	53 22 29.9 - 39	
14	198 49.8	27 50.1		24.7	37 47.8		13.9	57 04.0		41.2	333 58.9		49.7	105 01.0	54 22 26.0 - 41	
15	213 52.3	42 49.7	..	23.5	52 48.7	..	13.3	72 06.0	..	41.0	349 01.2	..	49.8	119 25.4	55 +22 21.9 - 42	
16	228 54.7	57 49.3		22.3	67 49.7		12.7	87 07.9		40.8	4 03.4		49.8	133 49.9	54 22 17.7 - 44	
17	243 57.2	72 48.9		21.1	82 50.7		12.1	102 09.9		40.7	19 05.7		49.9	148 14.3	55 22 13.3 - 45	
18	258 59.7	87 48.5	+ 5	19.8	97 51.6	+ 9	11.5	117 11.8	+15	40.5	34 08.0	-14	49.9	162 38.8	56 +22 08.8 - 46	
19	274 02.1	102 48.1		18.6	112 52.6		10.9	132 13.8		40.4	49 10.3		50.0	177 03.4	56 22 04.2 - 48	
20	289 04.6	117 47.7		17.4	127 53.6		10.3	147 15.7		40.2	64 12.5		50.1	191 28.0	56 21 59.4 - 50	
21	304 07.1	132 47.3	..	16.1	142 54.6	..	09.7	162 17.7	..	40.1	79 14.8	..	50.1	205 52.6	57 +21 54.4 - 51	
22	319 09.5	147 46.9		14.9	157 55.5		09.1	177 19.6		39.9	94 17.1		50.2	220 17.3	57 21 49.3 - 52	
23	334 12.0	162 46.5		13.7	172 56.5		08.5	192 21.6		39.8	109 19.3		50.3	234 42.0	58 21 44.1 - 54	
11	0	349 14.5	177 46.1	+ 5	12.4	187 57.5	+ 9	07.9	207 23.5	+15	39.6	124 21.6	-14	50.3	249 06.8	59 +21 38.7 - 55
1	4 16.9	192 45.7		11.2	202 58.4		07.3	222 25.5		39.4	139 23.9		50.4	263 31.7	58 21 33.2 - 56	
2	19 19.4	207 45.3		10.0	217 59.4		06.7	237 27.5		39.3	154 26.2		50.5	277 56.5	60 21 27.6 - 58	
3	34 21.8	222 44.9	..	08.7	233 00.4	..	06.1	252 29.4	..	39.1	169 28.4	..	50.5	292 21.5	60 +21 21.8 - 60	
4	49 24.3	237 44.5		07.5	248 01.4		05.5	267 31.4		39.0	184 30.7		50.6	306 46.5	60 21 15.8 - 60	
5	64 26.8	252 44.1		06.3	263 02.3		04.9	282 33.3		38.8	199 33.0		50.6	321 11.5	61 21 09.8 - 62	
6	79 29.2	267 43.7	+ 5	05.0	278 03.3	+ 9	04.3	297 35.3	+15	38.7	214 35.2	-14	50.7	335 36.6	62 +21 03.6 - 64	
7	94 31.7	282 43.3		03.8	293 04.3		03.7	312 37.2		38.5	229 37.5		50.8	350 01.8	62 20 57.2 - 64	
8	109 34.2	297 42.9		02.6	308 05.3		03.1	327 39.2		38.3	244 39.8		50.8	4 27.0	62 20 50.8 - 66	
9	124 36.6	312 42.5	..	01.3	323 06.2	..	02.5	342 41.1	..	38.2	259 42.0	..	50.9	18 52.2	64 +20 44.2 - 68	
10	139 39.1	327 42.1		00.1	338 07.2		01.9	357 43.1		38.0	274 44.3		51.0	33 17.6	63 20 37.4 - 68	
11	154 41.6	342 41.7		4 58.8	353 08.2		01.3	12 45.0		37.9	289 46.6		51.0	47 42.9	65 20 30.6 - 70	
12	169 44.0	357 41.3	+ 4	57.6	8 09.1	+ 9	00.7	27 47.0	+15	37.7	304 48.9	-14	51.1	62 08.4	65 +20 23.6 - 72	
13	184 46.5	12 40.9		56.4	23 10.1		9 00.0	42 49.0		37.6	319 51.1		51.2	76 33.9	66 20 16.4 - 72	
14	199 49.0	27 40.5		55.1	38 11.1		8 59.4	57 50.9		37.4	334 53.4		51.2	90 59.5	66 20 09.2 - 74	
15	214 51.4	42 40.1	..	53.9	53 12.1	..	58.8	72 52.9	..	37.3	349 55.7	..	51.3	105 25.1	67 +20 01.8 - 75	
16	229 53.9	57 39.7		52.7	68 13.0		58.2	87 54.8		37.1	4 57.9		51.3	119 50.8	67 19 54.3 - 76	
17	244 56.3	72 39.3		51.4	83 14.0		57.6	102 56.8		36.9	20 00.2		51.4	134 16.5	69 19 46.7 - 78	
18	259 58.8	87 38.9	+ 4	50.2	98 15.0	+ 8	57.0	117 58.7	+15	36.8	35 02.5	-14	51.5	148 42.4	69 +19 38.9 - 79	
19	275 01.3	102 38.5		49.0	113 16.0		56.4	133 00.7		36.6	50 04.7		51.5	163 08.3	69 19 31.0 - 80	
20	290 03.7	117 38.1		47.7	128 16.9		55.8	148 02.7		36.5	65 07.0		51.6	177 34.2	70 19 23.0 - 81	
21	305 06.2	132 37.7	..	46.5	143 17.9	..	55.2	163 04.6	..	36.3	80 09.3	..	51.7	192 00.2	71 +19 14.9 - 82	
22	320 08.7	147 37.3		45.2	158 18.9		54.6	178 06.6		36.2	95 11.6		51.7	206 26.3	72 19 06.7 - 84	
23	335 11.1	162 36.9		44.0	173 19.9		54.0	193 08.5		36.0	110 13.8		51.8	220 52.5	72 18 58.3 - 84	
12	0	350 13.6	177 36.5	+ 4	42.8	188 20.8	+ 8	53.4	208 10.5	+15	35.9	125 16.1	-14	51.9	235 18.7	73 +18 49.9 - 86
1	5 16.1	192 36.1		41.5	203 21.8		52.8	223 12.4		35.7	140 18.4		51.9	249 45.0	73 18 41.3 - 87	
2	20 18.5	207 35.8		40.3	218 22.8		52.2	238 14.4		35.5	155 20.6		52.0	264 11.3	74 18 32.6 - 88	
3	35 21.0	222 35.4	..	39.0	233 23.7	..	51.6	253 16.3	..	35.4	170 22.9	..	52.1	278 37.7	75 +18 23.8 - 89	
4	50 23.4	237 35.0		37.8	248 24.7		51.0	268 18.3		35.2	185 25.2		52.1	293 04.2	76 18 14.9 - 91	
5	65 25.9	252 34.6		36.6	263 25.7		50.4	283 20.3		35.1	200 27.4		52.2	307 30.8	76 18 05.8 - 91	
6	80 28.4	267 34.2	+ 4	35.3	278 26.7	+ 8	49.8	298 22.2	+15	34.9	215 29.7	-14	52.3	321 57.4	77 +17 56.7 - 93	
7	95 30.8	282 33.8		34.1	293 27.6		49.1	313 24.2		34.8	230 32.0		52.3	336 24.1	78 17 47.4 - 93	
8	110 33.3	297 33.4		32.8	308 28.6		48.5	328 26.1		34.6	245 34.2		52.4	350 50.9	79 17 38.1 - 95	
9	125 35.8	312 33.0	..	31.6	323 29.6	..	47.9	343 28.1	..	34.4	260 36.5	..	52.4	5 17.8	79 +17 28.6 - 95	
10	140 38.2	327 32.6		30.4	338 30.6		47.3	358 30.0		34.3	275 38.8		52.5	19 44.7	80 17 19.1 - 97	
11	155 40.7	342 32.2		29.1	353 31.5		46.7	13 32.0		34.1	290 41.0		52.6	34 11.7	80 17 09.4 - 97	
12	170 43.2	357 31.8	+ 4	27.9	8 32.5	+ 8	46.1	28 34.0	+15	34.0	305 43.3	-14	52.6	48 38.7	81 +16 59.7 - 99	
13	185 45.6	12 31.4		26.6	23 33.5		45.5	43 35.9		33.8	320 45.6		52.7	63 05.8	82 16 49.8 - 99	
14	200 48.1	27 31.0		25.4	38 34.5		44.9	58 37.9		33.7	335 47.8		52.8	77 33.0	83 16 39.9 - 101	
15	215 50.6	42 30.6	..	24.1	53 35.4	..	44.3	73 39.8	..	33.5	350 50.1	..	52.8	92 00.3	83 +16 29.8 - 101	
16	230 53.0	57 30.2		22.9	68 36.4		43.7	88 41.8		33.4	5 52.4		52.9	106 27.6	84 16 19.7 - 103	
17	245 55.5	72 29.8		21.7	83 37.4		43.1	103 43.8		33.2	20 54.6		53.0	120 55.0	85 16 09.4 - 103	
18	260 57.9	87 29.5	+ 4	20.4	98 38.4	+ 8	42.5	118 45.7	+15	33.0	35 56.9	-14	53.0	135 22.5	86 +15 59.1 - 104	
19	276 00.4	102 29.1		19.2	113 39.3		41.9	133 47.7		32.9	50 59.2		53.1	149 50.1	86 15 48.7 - 106	
20	291 02.9	117 28.7		17.9	128 40.3		41.2	148 49.6		32.7	66 01.4		53.2	164 17.7	87 15 38.1 - 106	
21	306 05.3	132 28.3	..	16.7	143 41.3	..	40.6	163 51.6	..	32.6	81 03.7	..	53.2	178 45.4	87 +15 27.5 - 106	
22	321 07.8	147 27.9		15.4	158 42.3		40.0	178 53.5		32.4	96 06.0		53.3	193 13.1	89 15 16.9 - 108	
23	336 10.3	162 27.5		14.2	173 43.2		39.4	193 55.5		32.3	111 08.2		53.4	207 41.0	89 15 06.1 - 109	
24	351 12.7	177 27.1	+ 4	13.0	188 44.2	+ 8	38.8	208								

G M T	SUN		STARS		Lat.	Sunrise	Twit. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS				
	GHA	Dec.	No.	Name SHA				Dec.	10	11	12	13	Alt.	Sun's Low'r Limb Add	Venus Add	Mars Add
10	0	180 39.8 + 5 19.4	7	Acamar	315 50.9 -40 28.5	72	4 45	////	☐	☐	23 31	25 59				
	1	195 40.0 18.4	5	Achernar	335 58.4 -57 27.3	70	4 53	////	☐	☐	21 27	24 06	0 06			
	2	210 40.2 17.5	30	Acrux	173 58.5 -62 51.4	68	4 59	////	19 40	22 23	24 31	0 31				
	3	225 40.5 16.5	19	Adhara	255 46.7 -28 54.4	66	5 05	1 03	21 02	22 56	24 50	0 50				
	4	240 40.7 15.6	10	Aldebaran	291 39.0 +16 25.4	64	5 09	1 46	21 39	23 21	25 05	1 05	0			
	5	255 40.9 14.7				62	5 13	2 14	22 06	23 40	25 18	1 18	30	0.2	0.1	0.1
	6	270 41.1 + 5 13.7	32	Alioth	166 59.0 +56 12.1	60	5 16	2 34	22 26	23 55	25 28	1 28	45	0.2	0.1	0.0
	7	285 41.3 12.8	34	Alkaid	153 33.2 +49 32.2	58	5 19	2 50	22 43	24 08	0 08	1 37	60	0.2	0.1	0.0
	8	300 41.5 11.8	55	Al Na'ir	28 37.5 -47 10.5	56	5 22	3 03	22 58	24 20	0 20	1 45	75	0.2	0.0	0.0
	9	315 41.8 10.9	15	Alnilam	276 30.3 - 1 13.6	54	5 24	3 15	23 10	24 30	0 30	1 53	90	0.2	0.0	0.0
	10	330 42.0 09.9	25	Alphard	218 38.9 - 8 27.9	52	5 27	3 24	23 21	24 38	0 38	1 59				
	11	345 42.2 09.0				50	5 29	3 33	23 30	24 46	0 46	2 05				
	12	0 42.4 + 5 08.0	41	Alphecca	126 47.8 +26 52.0	45	5 33	3 50	23 51	25 03	1 03	2 17	Moon's Lower Limb			
	13	15 42.6 07.1	1	Alpheratz	358 28.0 +28 50.9	40	5 36	4 02	24 07	0 07	1 17	2 27	Add			
	14	30 42.8 06.1	51	Altair	62 50.2 + 8 45.2	35	5 39	4 13	24 21	0 21	1 28	2 36	Alt.	10	11	12
	15	45 43.1 05.2	2	Ankaa	353 57.9 -42 32.5	30	5 42	4 20	24 33	0 33	1 38	2 44	0			
	16	60 43.3 04.2	42	Antares	113 19.4 -26 20.2	20	5 46	4 32	24 53	0 53	1 56	2 57	4	18.5	18.3	18.1
	17	75 43.5 03.3				10	5 50	4 40	0 10	1 11	2 11	3 08	8	18.5	18.3	18.1
	18	90 43.7 + 5 02.4	37	Arcturus	146 35.4 +19 24.9	0	5 54	4 45	0 28	1 28	2 25	3 19	12	18.4	18.3	18.1
	19	105 43.9 01.4	43	Atria	109 00.2 -68 57.2	10	5 57	4 48	0 46	1 44	2 39	3 30	16	18.4	18.3	18.0
	20	120 44.1 5 00.5	22	Avior	234 36.3 -59 21.8	20	6 00	4 48	1 06	2 02	2 54	3 41	20	18.4	18.2	18.0
	21	135 44.4 + 4 59.5	13	Bellatrix	279 18.5 + 6 18.8	30	6 04	4 46	1 28	2 22	3 11	3 54	24	18.3	18.2	18.0
	22	150 44.6 58.6	16	Betelge'se	271 48.2 + 7 24.1	35	6 06	4 44	1 41	2 34	3 21	4 02	28	18.2	18.1	17.9
	23	165 44.8 57.6				40	6 09	4 40	1 56	2 48	3 32	4 10	32	18.2	18.1	17.8
			17	Canopus	264 15.5 -52 39.9	45	6 12	4 35	2 14	3 04	3 45	4 20	36	18.1	18.0	17.8
			12	Capella	281 38.4 +45 57.2	50	6 15	4 29	2 36	3 24	4 01	4 32	40	18.0	17.9	17.7
			53	Deneb	50 00.7 +45 07.6	52	6 16	4 25	2 46	3 33	4 09	4 37	44	17.9	17.8	17.6
			28	Denebola	183 18.0 +14 49.2	54	6 18	4 22	2 58	3 43	4 17	4 43	48	17.8	17.7	17.5
			4	Diphda	349 38.9 -18 13.5	56	6 20	4 17	3 12	3 55	4 27	4 50	52	17.7	17.6	17.4
						58	6 22	4 12	3 28	4 09	4 37	4 57	56	17.5	17.4	17.3
			27	Dubhe	194 45.2 +61 59.4	60	6 24	4 06	3 47	4 25	4 49	5 06	60	17.4	17.3	17.2
			14	Elnath	279 07.4 +28 34.3	S							64	17.3	17.2	17.0
			47	Eltanin	91 06.2 +51 29.9								68	17.1	17.0	16.9
			54	Enif	34 29.3 + 9 40.5								72	17.0	16.9	16.8
			56	Fomalhaut	16 11.3 -29 51.2								76	16.8	16.8	16.6
			31	Gacrux	172 49.8 -56 52.0	72	19 05	////	☐	☐	18 59	18 21	80	16.7	16.6	16.5
			29	Gienah	176 37.2 -17 17.8	70	18 58	////	☐	☐	19 07	18 23	84	16.5	16.5	16.4
			35	Hadar	149 49.9 -60 09.8	68	18 52	////	18 53	18 10	17 57	17 48	88	16.3	16.3	16.2
			6	Hamal	328 49.4 +23 15.4	66	18 47	22 38	17 30	17 36	17 37	17 36	90	16.2	16.2	16.1
			48	Kaus Aust.	84 41.1 -34 24.5	64	18 43	21 59	16 52	17 11	17 21	17 26		Add to table, back cover		
			62			62	18 39	21 34	16 25	16 51	17 07	17 17		Moon's Upper Limb		
			60	Kochab	137 18.5 +74 20.4	60	18 36	21 14	16 04	16 35	16 55	17 10		Subtract		
			57	Markab	14 21.1 +14 58.2	58	18 33	20 59	15 47	16 21	16 45	17 03	Alt.	10	11	12
			8	Menkar	315 00.2 + 3 55.2	56	18 30	20 46	15 32	16 09	16 37	16 57	0			
			36	Menkent	148 59.0 -36 09.3	54	18 28	20 35	15 19	15 59	16 29	16 52	4	13.9	14.0	14.1
			24	Miapl'dus	221 49.9 -69 32.0	52	18 26	20 25	15 08	15 50	16 22	16 47	8	13.9	14.0	14.1
						50	18 24	20 18	14 58	15 41	16 15	16 43	12	13.9	14.0	14.1
			9	Mirfak	309 42.2 +49 42.3	45	18 20	20 02	14 38	15 24	16 01	16 33	16	14.0	14.1	14.2
			50	Nunki	76 51.8 -26 21.2	40	18 17	19 50	14 21	15 09	15 50	16 25	20	14.0	14.1	14.2
			52	Peacock	54 26.9 -56 52.8	35	18 14	19 40	14 06	14 56	15 40	16 19	24	14.1	14.2	14.3
			21	Pollux	244 20.8 +28 08.0	30	18 11	19 32	13 54	14 46	15 32	16 13	28	14.2	14.3	14.4
			20	Procyon	245 45.2 + 5 20.4	20	18 07	19 21	13 33	14 27	15 17	16 02	32	14.3	14.4	14.5
						10	18 03	19 13	13 14	14 11	15 04	15 53	36	14.4	14.5	14.6
			46	R'alhague	96 46.6 +12 35.6	0	18 00	19 09	12 57	13 55	14 51	15 44	40	14.5	14.6	14.7
			26	Regulus	208 29.8 +12 11.1	10	17 57	19 07	12 39	13 40	14 39	15 35	44	14.6	14.7	14.8
			11	Rigel	281 53.7 - 8 14.9	20	17 54	19 07	12 21	13 23	14 25	15 26	48	14.7	14.8	14.9
			38	Rigil Kent.	140 51.4 -60 39.5	30	17 50	19 09	11 59	13 04	14 10	15 15	52	14.8	14.9	15.0
			44	Sabik	103 02.2 -15 40.3	35	17 48	19 12	11 46	12 53	14 01	15 08	56	15.0	15.1	15.2
						40	17 46	19 16	11 31	12 40	13 50	15 01	60	15.1	15.2	15.3
			3	Schedar	350 29.5 +56 17.8	45	17 43	19 21	11 14	12 24	13 38	14 52	64	15.2	15.3	15.4
			45	Shaula	97 20.7 -37 04.5	50	17 40	19 28	10 52	12 05	13 23	14 42	68	15.3	15.4	15.5
			18	Sirius	259 12.0 -16 39.1	52	17 38	19 31	10 42	11 56	13 16	14 37	72	15.4	15.5	15.6
			33	Spica	159 17.2 -10 55.8	54	17 37	19 35	10 30	11 46	13 08	14 32	76	15.5	15.6	15.7
			23	Suhail	223 24.7 -43 15.1	56	17 35	19 40	10 17	11 35	13 00	14 26	80	15.6	15.7	15.8
						58	17 33	19 45	10 01	11 22	12 50	14 19	84	15.7	15.8	15.9
			49	Vega	81 08.1 +38 44.8	60	17 31	19 51	9 42	11 06	12 38	14 12	88	15.8	15.9	16.0
			39	Zub'g'bi	137 53.6 -15 51.5	S							90	16.0	16.0	16.0
														Subtract from table, back cover		

G M T	VENUS - 3.5		MARS 2.0		JUPITER - 1.3		SATURN 0.8		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
13	h	°	°	°	°	°	°	°	°	°	°	°
0	351 12.7	177 27.1 + 4 13.0	188 44.2 + 8 38.8	208 57.5 +15 32.1	126 10.5 -14 53.4	222 08.9 89 +14 55.2 -109						
1	6 15.2	192 26.7 11.7	203 45.2 38.2	223 59.4 32.0	141 12.8 53.5	236 36.8 91 14 44.3 -110						
2	21 17.7	207 26.3 10.5	218 46.2 37.6	239 01.4 31.8	156 15.0 53.5	251 04.9 91 14 33.3 -111						
3	36 20.1	222 25.9 .. 09.2	233 47.1 .. 37.0	254 03.3 .. 31.6	171 17.3 .. 53.6	265 33.0 92 14 22.2 -112						
4	51 22.6	237 25.5 08.0	248 48.1 36.4	269 05.3 31.5	186 19.6 53.7	280 01.2 92 14 11.0 -113						
5	66 25.1	252 25.2 06.7	263 49.1 35.8	284 07.3 31.3	201 21.8 53.7	294 29.4 93 13 59.7 -113						
6	81 27.5	267 24.8 + 4 05.5	278 50.1 + 8 35.2	299 09.2 +15 31.2	216 24.1 -14 53.8	308 57.7 94 +13 48.4 -114						
7	96 30.0	282 24.4 04.2	293 51.1 34.6	314 11.2 31.0	231 26.3 53.9	323 26.1 95 13 37.0 -115						
8	111 32.4	297 24.0 03.0	308 52.0 33.9	329 13.1 30.9	246 28.6 53.9	337 54.6 95 13 25.5 -115						
9	126 34.9	312 23.6 .. 01.7	323 53.0 .. 33.3	344 15.1 .. 30.7	261 30.9 .. 54.0	352 23.1 96 13 14.0 -116						
10	141 37.4	327 23.2 + 4 00.5	338 54.0 32.7	359 17.1 30.6	276 33.1 54.1	6 51.7 96 13 02.4 -117						
11	156 39.8	342 22.8 3 59.2	353 55.0 32.1	14 19.0 30.4	291 35.4 54.1	21 20.3 97 12 50.7 -118						
12	171 42.3	357 22.4 + 3 58.0	8 55.9 + 8 31.5	29 21.0 +15 30.2	306 37.7 -14 54.2	35 49.0 98 12 38.9 -118						
13	186 44.8	12 22.0 56.8	23 56.9 30.9	44 22.9 30.1	321 39.9 54.3	50 17.8 99 12 27.1 -119						
14	201 47.2	27 21.6 55.5	38 57.9 30.3	59 24.9 29.9	336 42.2 54.3	64 46.7 99 12 15.2 -119						
15	216 49.7	42 21.3 .. 54.3	53 58.9 .. 29.7	74 26.9 .. 29.8	351 44.5 .. 54.4	79 15.6 99 12 03.3 -120						
16	231 52.2	57 20.9 53.0	68 59.8 29.1	89 28.8 29.6	6 46.7 54.5	93 44.5 101 11 51.3 -121						
17	246 54.6	72 20.5 51.8	84 00.8 28.5	104 30.8 29.5	21 49.0 54.5	108 13.6 101 11 39.2 -121						
18	261 57.1	87 20.1 + 3 50.5	99 01.8 + 8 27.9	119 32.7 +15 29.3	36 51.2 -14 54.6	122 42.7 102 +11 27.1 -122						
19	276 59.5	102 19.7 49.3	114 02.8 27.2	134 34.7 29.2	51 53.5 54.7	137 11.9 102 11 14.9 -122						
20	292 02.0	117 19.3 48.0	129 03.7 26.6	149 36.7 29.0	66 55.8 54.7	151 41.1 103 11 02.7 -123						
21	307 04.5	132 18.9 .. 46.8	144 04.7 .. 26.0	164 38.6 .. 28.8	81 58.0 .. 54.8	166 10.4 103 10 50.4 -123						
22	322 06.9	147 18.5 45.5	159 05.7 25.4	179 40.6 28.7	97 00.3 54.9	180 39.7 104 10 38.1 -124						
23	337 09.4	162 18.1 44.3	174 06.7 24.8	194 42.5 28.5	112 02.6 54.9	195 09.1 105 10 25.7 -125						
14	0	352 11.9	177 17.8 + 3 43.0	189 07.7 + 8 24.2	209 44.5 +15 28.4	127 04.8 -14 55.0	209 38.6 106 +10 13.2 -125					
1	7 14.3	192 17.4 41.8	204 08.6 23.6	224 46.5 28.2	142 07.1 55.1	224 08.2 105 10 00.7 -125						
2	22 16.8	207 17.0 40.5	219 09.6 23.0	239 48.4 28.1	157 09.3 55.1	238 37.7 107 9 48.2 -126						
3	37 19.3	222 16.6 .. 39.3	234 10.6 .. 22.4	254 50.4 .. 27.9	172 11.6 .. 55.2	253 07.4 107 9 35.6 -126						
4	52 21.7	237 16.2 38.0	249 11.6 21.8	269 52.4 27.8	187 13.9 55.3	267 37.1 108 9 23.0 -127						
5	67 24.2	252 15.8 36.8	264 12.5 21.1	284 54.3 27.6	202 16.1 55.3	282 06.9 108 9 10.3 -127						
6	82 26.7	267 15.4 + 3 35.5	279 13.5 + 8 20.5	299 56.3 +15 27.4	217 18.4 -14 55.4	296 36.7 109 + 8 57.6 -127						
7	97 29.1	282 15.0 34.3	294 14.5 19.9	314 58.2 27.3	232 20.7 55.5	311 06.6 109 8 44.9 -128						
8	112 31.6	297 14.7 33.0	309 15.5 19.3	330 00.2 27.1	247 22.9 55.5	325 36.5 110 8 32.1 -129						
9	127 34.0	312 14.3 .. 31.8	324 16.5 .. 18.7	345 02.2 .. 27.0	262 25.2 .. 55.6	340 06.5 110 8 19.2 -129						
10	142 36.5	327 13.9 30.5	339 17.4 18.1	0 04.1 26.8	277 27.4 55.6	354 36.5 111 8 06.4 -129						
11	157 39.0	342 13.5 29.3	354 18.4 17.5	15 06.1 26.7	292 29.7 55.7	9 06.6 112 7 53.5 -130						
12	172 41.4	357 13.1 + 3 28.0	9 19.4 + 8 16.9	30 08.0 +15 26.5	307 32.0 -14 55.8	23 36.8 112 + 7 40.5 -129						
13	187 43.9	12 12.7 26.8	24 20.4 16.3	45 10.0 26.4	322 34.2 55.8	38 07.0 112 7 27.6 -130						
14	202 46.4	27 12.3 25.5	39 21.3 15.6	60 12.0 26.2	337 36.5 55.9	52 37.2 113 7 14.6 -131						
15	217 48.8	42 12.0 .. 24.2	54 22.3 .. 15.0	75 13.9 .. 26.0	352 38.7 .. 56.0	67 07.5 114 7 01.5 -130						
16	232 51.3	57 11.6 23.0	69 23.3 14.4	90 15.9 25.9	7 41.0 56.0	81 37.9 113 6 48.5 -131						
17	247 53.8	72 11.2 21.7	84 24.3 13.8	105 17.9 25.7	22 43.3 56.1	96 08.2 115 6 35.4 -131						
18	262 56.2	87 10.8 + 3 20.5	99 25.3 + 8 13.2	120 19.8 +15 25.6	37 45.5 -14 56.2	110 38.7 115 + 6 22.3 -131						
19	277 58.7	102 10.4 19.2	114 26.2 12.6	135 21.8 25.4	52 47.8 56.2	125 09.2 115 6 09.2 -132						
20	293 01.1	117 10.0 18.0	129 27.2 12.0	150 23.8 25.3	67 50.0 56.3	139 39.7 116 5 56.0 -132						
21	308 03.6	132 09.6 .. 16.7	144 28.2 .. 11.4	165 25.7 .. 25.1	82 52.3 .. 56.4	154 10.3 116 5 42.8 -132						
22	323 06.1	147 09.3 15.5	159 29.2 10.7	180 27.7 25.0	97 54.6 56.4	168 40.9 117 5 29.6 -132						
23	338 08.5	162 08.9 14.2	174 30.1 10.1	195 29.6 24.8	112 56.8 56.5	183 11.6 117 5 16.4 -132						
15	0	353 11.0	177 08.5 + 3 13.0	189 31.1 + 8 09.5	210 31.6 +15 24.7	127 59.1 -14 56.6	197 42.3 118 + 5 03.2 -133					
1	8 13.5	192 08.1 11.7	204 32.1 08.9	225 33.6 24.5	143 01.3 56.6	212 13.1 118 4 49.9 -132						
2	23 15.9	207 07.7 10.5	219 33.1 08.3	240 35.5 24.3	158 03.6 56.7	226 43.9 118 4 36.7 -133						
3	38 18.4	222 07.3 .. 09.2	234 34.1 .. 07.7	255 37.5 .. 24.2	173 05.9 .. 56.8	241 14.7 119 4 23.4 -133						
4	53 20.9	237 06.9 07.9	249 35.0 07.1	270 39.5 24.0	188 08.1 56.8	255 45.6 119 4 10.1 -133						
5	68 23.3	252 06.6 06.7	264 36.0 06.5	285 41.4 23.9	203 10.4 56.9	270 16.5 120 3 56.8 -133						
6	83 25.8	267 06.2 + 3 05.4	279 37.0 + 8 05.8	300 43.4 +15 23.7	218 12.6 -14 57.0	284 47.5 120 + 3 43.5 -133						
7	98 28.3	282 05.8 04.2	294 38.0 05.2	315 45.4 23.6	233 14.9 57.0	299 18.5 120 3 30.2 -134						
8	113 30.7	297 05.4 02.9	309 39.0 04.6	330 47.3 23.4	248 17.2 57.1	313 49.5 121 3 16.8 -133						
9	128 33.2	312 05.0 .. 01.7	324 39.9 .. 04.0	345 49.3 .. 23.3	263 19.4 .. 57.2	328 20.6 121 3 03.5 -133						
10	143 35.6	327 04.6 3 00.4	339 40.9 03.4	0 51.2 23.1	278 21.7 57.2	342 51.7 121 2 50.2 -134						
11	158 38.1	342 04.3 2 59.2	354 41.9 02.8	15 53.2 22.9	293 23.9 57.3	357 22.8 122 2 36.8 -133						
12	173 40.6	357 03.9 + 2 57.9	9 42.9 + 8 02.2	30 55.2 +15 22.8	308 26.2 -14 57.4	11 54.0 122 + 2 23.5 -134						
13	188 43.0	12 03.5 56.6	24 43.9 01.6	45 57.1 22.6	323 28.4 57.4	26 25.2 123 2 10.1 -133						
14	203 45.5	27 03.1 55.4	39 44.8 00.9	60 59.1 22.5	338 30.7 57.5	40 56.5 123 1 56.8 -134						
15	218 48.0	42 02.7 .. 54.1	54 45.8 8 00.3	76 01.1 .. 22.3	353 33.0 .. 57.6	55 27.8 123 1 43.4 -133						
16	233 50.4	57 02.3 52.9	69 46.8 7 59.7	91 03.0 22.2	8 35.2 57.6	69 59.1 123 1 30.1 -134						
17	248 52.9	72 02.0 51.6	84 47.8 59.1	106 05.0 22.0	23 37.5 57.7	84 30.4 124 1 16.7 -133						
18	263 55.4	87 01.6 + 2 50.4	99 48.8 + 7 58.5	121 07.0 +15 21.9	38 39.7 -14 57.8	99 01.8 124 + 1 03.4 -133						
19	278 57.8	102 01.2 49.1	114 49.7 57.9	136 08.9 21.7	53 42.0 57.8	113 33.2 124 0 50.1 -134						
20	294 00.3	117 00.8 47.8	129 50.7 57.3	151 10.9 21.6	68 44.3 57.9	128 04.6 124 0 36.7 -133						
21	309 02.8	132 00.4 .. 46.6	144 51.7 .. 56.6	166 12.9 .. 21.4	83 46.5 .. 58.0	142 36.0 125 0 23.4 -133						
22	324 05.2	147 00.0 45.3	159 52.7 56.0	181 14.8 21.2	98 48.8 58.0	157 07.5 125 + 0 10.1 -133						
23	339 07.7	161 59.7 44.1	174 53.7 55.4	196 16.8 21.1	113 51.0 58.1	171 39.0 125 - 0 03.2 -133						
24	354 10.1	176 59.3 + 2 42.8	189 54.6 + 7 54.8	211 18.8 +15 20.9	128 53.3 -14 58.2	186 10.5 126 - 0 16.5 -132						
code	-	- 4 - 12	+ 10 - 6	+ 20 - 1	+ 22 0							

G M T	VENUS - 3.5		MARS 2.0		JUPITER - 1.4		SATURN 0.8		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
16 0	354 10.1	176 59.3 + 2 42.8	189 54.6 + 7 54.8	211 18.8 +15 20.9	128 53.3 -14 58.2	186 10.5 126 - 0 16.5 -132						
1 1	9 12.6	191 58.9 41.6	204 55.6 54.2	226 20.7 20.8	143 55.5 58.2	200 42.1 126 0 29.7 -133						
2 2	24 15.1	206 58.5 40.3	219 56.6 53.6	241 22.7 20.6	158 57.8 58.3	215 13.7 126 0 43.0 -132						
3 3	39 17.5	221 58.1 .. 39.0	234 57.6 .. 53.0	256 24.7 .. 20.5	174 00.0 .. 58.4	229 45.3 126 0 56.2 -133						
4 4	54 20.0	236 57.7 37.8	249 58.6 52.3	271 26.6 20.3	189 02.3 58.4	244 16.9 126 1 09.5 -132						
5 5	69 22.5	251 57.4 36.5	264 59.5 51.7	286 28.6 20.2	204 04.6 58.5	258 48.5 127 1 22.7 -132						
6 6	84 24.9	266 57.0 + 2 35.3	280 00.5 + 7 51.1	301 30.6 +15 20.0	219 06.8 -14 58.6	273 20.2 127 - 1 35.9 -131						
7 7	99 27.4	281 56.6 34.0	295 01.5 50.5	316 32.5 19.8	234 09.1 58.6	287 51.9 127 1 49.0 -132						
8 8	114 29.9	296 56.2 32.7	310 02.5 49.9	331 34.5 19.7	249 11.3 58.7	302 23.6 127 2 02.2 -131						
9 9	129 32.3	311 55.8 .. 31.5	325 03.5 .. 49.3	346 36.5 .. 19.5	264 13.6 .. 58.8	316 55.3 127 2 15.3 -131						
10 10	144 34.8	326 55.5 30.2	340 04.4 48.7	1 38.4 19.4	279 15.8 58.8	331 27.0 128 2 28.4 -131						
11 11	159 37.2	341 55.1 29.0	355 05.4 48.0	16 40.4 19.2	294 18.1 58.9	345 58.8 127 2 41.5 -131						
12 12	174 39.7	356 54.7 + 2 27.7	10 06.4 + 7 47.4	31 42.4 +15 19.1	309 20.4 -14 59.0	0 30.5 128 - 2 54.6 -130						
13 13	189 42.2	11 54.3 26.4	25 07.4 46.8	46 44.3 18.9	324 22.6 59.0	15 02.3 128 3 07.6 -130						
14 14	204 44.6	26 53.9 25.2	40 08.4 46.2	61 46.3 18.8	339 24.9 59.1	29 34.1 128 3 20.6 -130						
15 15	219 47.1	41 53.6 .. 23.9	55 09.3 .. 45.6	76 48.3 .. 18.6	354 27.1 .. 59.2	44 05.9 128 3 33.6 -129						
16 16	234 49.6	56 53.2 22.7	70 10.3 45.0	91 50.2 18.5	9 29.4 59.2	58 37.7 129 3 46.5 -130						
17 17	249 52.0	71 52.8 21.4	85 11.3 44.3	106 52.2 18.3	24 31.6 59.3	73 09.6 128 3 59.5 -129						
18 18	264 54.5	86 52.4 + 2 20.1	100 12.3 + 7 43.7	121 54.2 +15 18.1	39 33.9 -14 59.4	87 41.4 129 - 4 12.4 -128						
19 19	279 57.0	101 52.0 18.9	115 13.3 43.1	136 56.1 18.0	54 36.1 59.4	102 13.3 128 4 25.2 -128						
20 20	294 59.4	116 51.6 17.6	130 14.3 42.5	151 58.1 17.8	69 38.4 59.5	116 45.1 129 4 38.0 -128						
21 21	310 01.9	131 51.3 .. 16.3	145 15.2 .. 41.9	167 00.1 .. 17.7	84 40.6 .. 59.6	131 17.0 129 4 50.8 -128						
22 22	325 04.4	146 50.9 15.1	160 16.2 41.3	182 02.0 17.5	99 42.9 59.7	145 48.9 129 5 03.6 -127						
23 23	340 06.8	161 50.5 13.8	175 17.2 40.6	197 04.0 17.4	114 45.2 59.7	160 20.8 129 5 16.3 -127						
17 0	355 09.3	176 50.1 + 2 12.6	190 18.2 + 7 40.0	212 06.0 +15 17.2	129 47.4 -14 59.8	174 52.7 129 - 5 29.0 -126						
1 1	10 11.7	191 49.7 11.3	205 19.2 39.4	227 08.0 17.1	144 49.7 59.9	189 24.6 129 5 41.6 -126						
2 2	25 14.2	206 49.4 10.0	220 20.1 38.8	242 09.9 16.9	159 51.9 14 59.9	203 56.5 129 5 54.2 -126						
3 3	40 16.7	221 49.0 .. 08.8	235 21.1 .. 38.2	257 11.9 .. 16.8	174 54.2 15 00.0	218 28.4 130 6 06.8 -125						
4 4	55 19.1	236 48.6 07.5	250 22.1 37.6	272 13.9 16.6	189 56.4 00.1	233 00.4 129 6 19.3 -125						
5 5	70 21.6	251 48.2 06.3	265 23.1 36.9	287 15.8 16.4	204 58.7 00.1	247 32.3 129 6 31.8 -125						
6 6	85 24.1	266 47.8 + 2 05.0	280 24.1 + 7 36.3	302 17.8 +15 16.3	220 00.9 -15 00.2	262 04.2 130 - 6 44.3 -123						
7 7	100 26.5	281 47.5 03.7	295 25.1 35.7	317 19.8 16.1	235 03.2 00.3	276 36.2 129 6 56.6 -124						
8 8	115 29.0	296 47.1 02.5	310 26.0 35.1	332 21.7 16.0	250 05.4 00.3	291 08.1 129 7 09.0 -123						
9 9	130 31.5	311 46.7 2 01.2	325 27.0 .. 34.5	347 23.7 .. 15.8	265 07.7 .. 00.4	305 40.0 130 7 21.3 -123						
10 10	145 33.9	326 46.3 1 59.9	340 28.0 33.9	2 25.7 15.7	280 09.9 00.5	320 12.0 129 7 33.6 -122						
11 11	160 36.4	341 45.9 58.7	355 29.0 33.2	17 27.6 15.5	295 12.2 00.5	334 43.9 129 7 45.8 -121						
12 12	175 38.8	356 45.6 + 1 57.4	10 30.0 + 7 32.6	32 29.6 +15 15.4	310 14.4 -15 00.6	349 15.8 130 - 7 57.9 -122						
13 13	190 41.3	11 45.2 56.1	25 31.0 32.0	47 31.6 15.2	325 16.7 00.7	3 47.8 129 8 10.1 -120						
14 14	205 43.8	26 44.8 54.9	40 31.9 31.4	62 33.6 15.1	340 19.0 00.7	18 19.7 129 8 22.1 -120						
15 15	220 46.2	41 44.4 .. 53.6	55 32.9 .. 30.8	77 35.5 .. 14.9	355 21.2 .. 00.8	32 51.6 130 8 34.1 -120						
16 16	235 48.7	56 44.1 52.4	70 33.9 30.2	92 37.5 14.8	10 23.5 00.9	47 23.6 129 8 46.1 -119						
17 17	250 51.2	71 43.7 51.1	85 34.9 29.5	107 39.5 14.6	25 25.7 00.9	61 55.5 129 8 58.0 -119						
18 18	265 53.6	86 43.3 + 1 49.8	100 35.9 + 7 28.9	122 41.4 +15 14.4	40 28.0 -15 01.0	76 27.4 129 9 09.9 -118						
19 19	280 56.1	101 42.9 48.6	115 36.8 28.3	137 43.4 14.3	55 30.2 01.1	90 59.3 129 9 21.7 -117						
20 20	295 58.6	116 42.5 47.3	130 37.8 27.7	152 45.4 14.1	70 32.5 01.1	105 31.2 130 9 33.4 -117						
21 21	311 01.0	131 42.2 .. 46.0	145 38.8 .. 27.1	167 47.3 .. 14.0	85 34.7 .. 01.2	120 03.2 129 9 45.1 -116						
22 22	326 03.5	146 41.8 44.8	160 39.8 26.5	182 49.3 13.8	100 37.0 01.3	134 35.1 128 9 56.7 -116						
23 23	341 06.0	161 41.4 43.5	175 40.8 25.8	197 51.3 13.7	115 39.2 01.3	149 06.9 129 10 08.3 -115						
18 0	356 08.4	176 41.0 + 1 42.2	190 41.8 + 7 25.2	212 53.3 +15 13.5	130 41.5 -15 01.4	163 38.8 129 -10 19.8 -115						
1 1	11 10.9	191 40.6 41.0	205 42.7 24.6	227 55.2 13.4	145 43.7 01.5	178 10.7 129 10 31.3 -114						
2 2	26 13.3	206 40.3 39.7	220 43.7 24.0	242 57.2 13.2	160 46.0 01.5	192 42.6 128 10 42.7 -113						
3 3	41 15.8	221 39.9 .. 38.4	235 44.7 .. 23.4	257 59.2 .. 13.1	175 48.2 .. 01.6	207 14.4 129 10 54.0 -113						
4 4	56 18.3	236 39.5 37.2	250 45.7 22.7	273 01.1 12.9	190 50.5 01.7	221 46.3 128 11 05.3 -112						
5 5	71 20.7	251 39.1 35.9	265 46.7 22.1	288 03.1 12.7	205 52.7 01.8	236 18.1 129 11 16.5 -111						
6 6	86 23.2	266 38.7 + 1 34.6	280 47.7 + 7 21.5	303 05.1 +15 12.6	220 55.0 -15 01.8	250 50.0 128 -11 27.6 -111						
7 7	101 25.7	281 38.4 33.4	295 48.6 20.9	318 07.1 12.4	235 57.2 01.9	265 21.8 128 11 38.7 -110						
8 8	116 28.1	296 38.0 32.1	310 49.6 20.3	333 09.0 12.3	250 59.5 02.0	279 53.6 128 11 49.7 -110						
9 9	131 30.6	311 37.6 .. 30.8	325 50.6 .. 19.7	348 11.0 .. 12.1	266 01.7 .. 02.0	294 25.4 128 12 00.7 -108						
10 10	146 33.1	326 37.2 29.6	340 51.6 19.0	3 13.0 12.0	281 04.0 02.1	308 57.2 128 12 11.5 -108						
11 11	161 35.5	341 36.9 28.3	355 52.6 18.4	18 15.0 11.8	296 06.2 02.2	323 29.0 128 12 22.3 -108						
12 12	176 38.0	356 36.5 + 1 27.0	10 53.6 + 7 17.8	33 16.9 +15 11.7	311 08.5 -15 02.2	338 00.8 127 -12 33.1 -107						
13 13	191 40.4	11 36.1 25.8	25 54.6 17.2	48 18.9 11.5	326 10.7 02.3	352 32.5 128 12 43.8 -106						
14 14	206 42.9	26 35.7 24.5	40 55.5 16.6	63 20.9 11.4	341 13.0 02.4	7 04.3 127 12 54.4 -105						
15 15	221 45.4	41 35.3 .. 23.2	55 56.5 .. 15.9	78 22.8 .. 11.2	356 15.2 .. 02.4	21 36.0 127 13 04.9 -105						
16 16	236 47.8	56 35.0 22.0	70 57.5 15.3	93 24.8 11.1	11 17.5 02.5	36 07.7 127 13 15.4 -104						
17 17	251 50.3	71 34.6 20.7	85 58.5 14.7	108 26.8 10.9	26 19.7 02.6	50 39.4 127 13 25.8 -103						
18 18	266 52.8	86 34.2 + 1 19.4	100 59.5 + 7 14.1	123 28.8 +15 10.7	41 22.0 -15 02.6	65 11.1 126 -13 36.1 -103						
19 19	281 55.2	101 33.8 18.2	116 00.5 13.5	138 30.7 10.6	56 24.2 02.7	79 42.7 127 13 46.4 -101						
20 20	296 57.7	116 33.5 16.9	131 01.4 12.8	153 32.7 10.4	71 26.5 02.8	94 14.4 126 13 56.5 -101						
21 21	312 00.2	131 33.1 .. 15.6	146 02.4 .. 12.2	168 34.7 .. 10.3	86 28.7 .. 02.8	108 46.0 126 14 06.6 -101						
22 22	327 02.6	146 32.7 14.4	161 03.4 11.6	183 36.7 10.1	101 31.0 02.9	123 17.6 126 14 16.7 -99						
23 23	342 05.1	161 32.3 13.1	176 04.4 11.0	198 38.6 10.0	116 33.2 03.0	137 49.2 126 14 26.6 -99						
24 24	357 07.6	176 32.0 + 1 11.8	191 05.4 + 7 10.4	213 40.6 +15 09.8	131 35.5 -15 03.1	152 20.8 126 -14 36.5 -98						
code	-	- 4 - 13	+ 10 - 6	+ 20 - 2	+ 23 - 1							

G M T	SUN		STARS		Lat.	Sunrise	Twit. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS						
	GHA	Dec.	No.	Name SHA Dec.				16	17	18	19	Alt.	Sun's Low'r Limb	Venus	Mars			
h	°	'			N	h m	h m	h m	h m	h m	h m	h m	h m	°	'	'	'	
16	0	181 11.3 + 3 02.0	7	Acamar 315 50.8 -40 28.5	72	5 13	////	6 09	8 09	10 14	12 44			Alt.				
	1	196 11.6 - 01.0	5	Achernar 335 58.3 -57 27.4	70	5 17	////	6 06	7 57	9 51	11 52				Add	Add	Add	
	2	211 11.8 3 00.0	30	Acrux 173 58.5 -62 51.4	68	5 21	1 12	6 04	7 48	9 33	11 21							
	3	226 12.0 - 2 59.1	19	Adhara 255 46.7 -28 54.4	66	5 24	1 54	6 02	7 41	9 19	10 57							
	4	241 12.2 58.1	10	Aldebaran 291 39.0 +16 25.4	64	5 26	2 20	6 01	7 35	9 07	10 39			0				
	5	256 12.4 57.2			62	5 29	2 40	6 00	7 29	8 58	10 24			30	0.2	0.1	0.1	
	6	271 12.7 + 2 56.2	32	Alioth 166 59.0 +56 12.1	60	5 31	2 56	5 59	7 25	8 49	10 12			45	0.2	0.1	0.0	
	7	286 12.9 55.2	34	Alkaid 153 33.3 +49 32.2	58	5 32	3 09	5 58	7 21	8 42	10 01			60	0.2	0.1	0.0	
	8	301 13.1 54.3	55	Al Na'ir 28 37.5 -47 10.5	56	5 34	3 20	5 57	7 17	8 36	9 52			75	0.2	0.0	0.0	
	9	316 13.3 - 53.3	15	Alnilam 276 30.3 - 1 13.6	54	5 35	3 29	5 56	7 14	8 30	9 44			90	0.2	0.0	0.0	
	10	331 13.5 52.3	25	Alphard 218 38.9 - 8 27.9	52	5 36	3 37	5 55	7 11	8 25	9 37							
	11	346 13.8 51.4			50	5 38	3 44	5 55	7 08	8 20	9 30							
	12	1 14.0 + 2 50.4	41	Alphecca 126 47.8 +26 51.9	45	5 40	3 59	5 54	7 02	8 10	9 16			Moon's Lower Limb				
	13	16 14.2 49.4	1	Alpheratz 358 28.0 +28 51.0	40	5 42	4 09	5 52	6 58	8 02	9 04			Add				
	14	31 14.4 48.5	51	Altair 62 50.3 + 8 45.2	35	5 44	4 18	5 51	6 53	7 55	8 54			Alt.	16	17	18	
	15	46 14.6 - 47.5	2	Ankaa 353 57.9 -42 32.5	30	5 45	4 25	5 51	6 50	7 48	8 46			0				
	16	61 14.9 46.6	42	Antares 113 19.5 -26 20.2	20	5 48	4 33	5 49	6 44	7 38	8 31			4	15.9	15.0	14.3	
	17	76 15.1 45.6			10	5 50	4 40	5 48	6 38	7 28	8 18			8	15.9	15.0	14.3	
	18	91 15.3 + 2 44.6	37	Arcturus 146 35.4 +19 24.8	0	5 52	4 43	5 47	6 33	7 20	8 07			12	15.9	15.1	14.3	
	19	106 15.5 43.7	43	Atria 109 00.3 -68 57.2	10	5 53	4 44	5 46	6 28	7 11	7 55			16	15.9	15.1	14.3	
	20	121 15.8 42.7	22	Avior 234 36.2 -59 21.8	20	5 55	4 43	5 45	6 23	7 02	7 42			20	15.9	15.1	14.4	
	21	136 16.0 - 41.7	13	Bellatrix 279 18.4 + 6 18.8	30	5 57	4 38	5 43	6 17	6 52	7 28			24	15.9	15.1	14.4	
	22	151 16.2 40.8	16	Betelge'se 271 48.2 + 7 24.1	35	5 58	4 35	5 42	6 14	6 46	7 19			28	15.9	15.1	14.4	
	23	166 16.4 39.8			40	5 59	4 31	5 42	6 10	6 39	7 10			32	15.9	15.1	14.4	
			17	Canopus 264 15.5 -52 39.9	45	6 00	4 24	5 41	6 05	6 31	6 59			36	15.9	15.1	14.4	
			12	Capella 281 38.4 +45 57.2	50	6 02	4 16	5 40	6 00	6 22	6 46			40	15.9	15.1	14.4	
			53	Deneb 50 00.7 +45 07.6	52	6 02	4 10	5 39	5 58	6 18	6 40			44	15.9	15.1	14.5	
			28	Denebola 183 18.0 +14 49.2	54	6 03	4 06	5 39	5 55	6 13	6 33			48	15.8	15.2	14.6	
			4	Diphda 349 38.9 -18 13.5	56	6 04	4 00	5 38	5 52	6 08	6 26			52	15.8	15.2	14.6	
					58	6 05	3 53	5 37	5 49	6 02	6 17			56	15.8	15.2	14.7	
			27	Dubhe 194 45.2 +61 59.3	60	6 05	3 46	5 37	5 45	5 55	6 08			60	15.8	15.2	14.7	
			14	Elnath 279 07.3 +28 34.3	S									64	15.8	15.3	14.8	
			47	Eltanin 91 06.2 +51 29.9		Lat.	Sunset	Twit. ends	Moonset						68	15.8	15.3	14.9
			54	Enif 34 29.3 + 9 40.5	N	h m	h m	h m	h m	h m	h m	h m	h m	72	15.7	15.3	15.0	
			56	Fomalhaut 16 11.2 -29 51.2	72	18 34	////	17 16	16 55	16 27	15 35			76	15.7	15.4	15.1	
			31	Gacrux 172 49.8 -56 52.0	70	18 30	////	17 21	17 08	16 52	16 28			80	15.7	15.4	15.1	
			29	Gienah 176 37.2 -17 17.8	68	18 27	22 25	17 26	17 19	17 11	17 01			84	15.7	15.4	15.2	
			35	Hadar 149 50.0 -60 09.8	66	18 24	21 47	17 30	17 28	17 26	17 25			88	15.6	15.4	15.3	
			6	Hamal 328 49.4 +23 15.4	64	18 21	21 22	17 33	17 36	17 39	17 44			Add to table, back cover				
			48	Kaus Aust. 84 41.1 -34 24.5	62	18 19	21 03	17 36	17 42	17 50	18 00			Moon's Upper Limb				
			40	Kochab 137 18.6 +74 20.4	60	18 17	20 48	17 39	17 48	17 59	18 13			Subtract				
			57	Markab 14 21.1 +14 58.3	58	18 16	20 36	17 41	17 53	18 07	18 24			Alt.	16	17	18	
			8	Menkar 315 00.1 + 3 55.2	56	18 14	20 25	17 43	17 58	18 14	18 34			0				
			36	Menkent 148 59.0 -36 09.3	54	18 13	20 17	17 45	18 02	18 21	18 43			4	15.3	15.8	16.3	
			24	Miapl'dus 221 49.8 -69 31.9	52	18 12	20 09	17 47	18 06	18 27	18 51			8	15.3	15.8	16.3	
			9	Mirfak 309 42.1 +49 42.3	50	18 11	20 02	17 48	18 09	18 32	18 58			12	15.3	15.8	16.2	
			50	Nunki 76 51.8 -26 21.2	45	18 09	19 49	17 52	18 17	18 43	19 13			16	15.3	15.8	16.2	
			52	Peacock 54 26.9 -56 52.8	40	18 07	19 39	17 54	18 23	18 53	19 26			20	15.4	15.8	16.2	
			21	Pollux 244 20.8 +28 08.0	35	18 05	19 30	17 57	18 28	19 01	19 36			24	15.4	15.8	16.2	
			20	Procyon 245 45.1 + 5 20.4	30	18 04	19 24	17 59	18 33	19 08	19 46			28	15.4	15.8	16.1	
					20	18 02	19 15	18 03	18 41	19 21	20 02			32	15.4	15.8	16.1	
					10	18 00	19 10	18 06	18 49	19 32	20 16			36	15.4	15.8	16.1	
			46	R'alhague 96 46.6 +12 35.7	0	17 58	19 07	18 09	18 55	19 42	20 29			40	15.4	15.7	16.0	
			26	Regulus 208 29.8 +12 11.1	10	17 56	19 06	18 12	19 02	19 52	20 43			44	15.4	15.7	16.0	
			11	Rigel 281 53.6 - 8 14.9	20	17 55	19 08	18 15	19 10	20 03	20 57			48	15.5	15.7	15.9	
			38	Rigel Kent.140 51.5 -60 39.5	30	17 53	19 13	18 19	19 18	20 16	21 13			52	15.5	15.7	15.9	
			44	Sabik 103 02.2 -15 40.3	35	17 52	19 16	18 21	19 23	20 24	21 23			56	15.5	15.7	15.8	
					40	17 51	19 21	18 24	19 28	20 32	21 34			60	15.5	15.6	15.6	
			3	Schedar 350 29.5 +56 17.8	45	17 50	19 28	18 27	19 35	20 42	21 47			64	15.5	15.6	15.6	
			45	Shaula 97 20.7 -37 04.5	50	17 49	19 38	18 30	19 43	20 54	22 02			68	15.5	15.6	15.6	
			18	Sirius 259 11.9 -16 39.1	52	17 48	19 42	18 32	19 46	20 59	22 10			72	15.5	15.6	15.6	
			33	Spica 159 17.2 -10 55.8	54	17 48	19 48	18 33	19 50	21 05	22 18			76	15.5	15.5	15.5	
			23	Suhail 223 24.7 -43 15.0	56	17 47	19 53	18 35	19 55	21 12	22 27			80	15.6	15.5	15.4	
					58	17 46	20 00	18 37	19 59	21 20	22 38			84	15.6	15.5	15.3	
			49	Vega 81 08.2 +38 44.8	60	17 45	20 08	18 40	20 05	21 29	22 50			88	15.6	15.4	15.3	
			39	Zub'g'bi 137 53.6 -15 51.5	S									90	15.6	15.4	15.3	
					G M T	Equation of Time (App.—Mean)			GMT of Transit Meridian of Greenwich				Subtract from table, back cover					
						16	17	18	DAY	Moon	Venus	Mars	Jupiter	Saturn				
					h	m s	m s	m s		h m	h m	h m	h m	h m				
					0	+ 4 44.9	+ 5 06.1	+ 5 27.4										
					6	+ 4 50.2	+ 5 11.4	+ 5 32.7	16	11 58	12 12	11 20	9 54	15 22				
					12	+ 4 55.5	+ 5 16.7	+ 5 38.0	17	12 44	12 13	11 18	9 50	15 19				
					18	+ 5 00.8	+ 5 22.1	+ 5 43.3	18	13 31	12 14	11 17	9 47	15 15				
					24	+ 5 06.1	+ 5 27.4	+ 5 48.6	19	14 18	12 14	11 15	9 44	15 11				
					</													

G M T	VENUS — 3.5		MARS 2.0		JUPITER — 1.4		SATURN 0.8		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
19 0	357 07.6	176 32.0	+ 1 11.8	191 05.4	+ 7 10.4	213 40.6	+15 09.8	131 35.5	-15 03.1	152 20.8	126	-14 36.5 - 98
1 1	12 10.0	191 31.6	10.6	206 06.4	09.7	228 42.6	09.7	146 37.7	03.1	166 52.4	126	14 46.3 - 97
2 2	27 12.5	206 31.2	09.3	221 07.3	09.1	243 44.6	09.5	161 40.0	03.2	181 24.0	125	14 56.0 - 96
3 3	42 14.9	221 30.8	.. 08.0	236 08.3	.. 08.5	258 46.5	.. 09.4	176 42.2	.. 03.3	195 55.5	125	15 05.6 - 96
4 4	57 17.4	236 30.4	06.8	251 09.3	07.9	273 48.5	09.2	191 44.5	03.3	210 27.0	125	15 15.2 - 95
5 5	72 19.9	251 30.1	05.5	266 10.3	07.3	288 50.5	09.1	206 46.7	03.4	224 58.5	125	15 24.7 - 94
6 6	87 22.3	266 29.7	+ 1 04.2	281 11.3	+ 7 06.6	303 52.5	+15 08.9	221 49.0	-15 03.5	239 30.0	125	-15 34.1 - 93
7 7	102 24.8	281 29.3	03.0	296 12.3	06.0	318 54.4	08.7	236 51.2	03.5	254 01.5	124	15 43.4 - 92
8 8	117 27.3	296 28.9	01.7	311 13.3	05.4	333 56.4	08.6	251 53.5	03.6	268 32.9	124	15 52.6 - 92
9 9	132 29.7	311 28.6	+ 1 00.4	326 14.2	.. 04.8	348 58.4	.. 08.4	266 55.7	.. 03.7	283 04.3	124	16 01.8 - 90
10 10	147 32.2	326 28.2	0 59.2	341 15.2	04.2	4 00.3	08.3	281 57.9	03.7	297 35.7	124	16 10.8 - 90
11 11	162 34.7	341 27.8	57.9	356 16.2	03.5	19 02.3	08.1	297 00.2	03.8	312 07.1	124	16 19.8 - 89
12 12	177 37.1	356 27.4	+ 0 56.6	11 17.2	+ 7 02.9	34 04.3	+15 08.0	312 02.4	-15 03.9	326 38.5	123	-16 28.7 - 88
13 13	192 39.6	11 27.0	55.4	26 18.2	02.3	49 06.3	07.8	327 04.7	03.9	341 09.8	124	16 37.5 - 88
14 14	207 42.1	26 26.7	54.1	41 19.2	01.7	64 08.3	07.7	342 06.9	04.0	355 41.2	123	16 46.3 - 86
15 15	222 44.5	41 26.3	.. 52.8	56 20.2	.. 01.1	79 10.2	.. 07.5	357 09.2	.. 04.1	10 12.5	123	-16 54.9 - 86
16 16	237 47.0	56 25.9	51.6	71 21.1	7 00.4	94 12.2	07.4	12 11.4	04.2	24 43.8	122	17 03.5 - 84
17 17	252 49.4	71 25.5	50.3	86 22.1	6 59.8	109 14.2	07.2	27 13.7	04.2	39 15.0	123	17 11.9 - 84
18 18	267 51.9	86 25.2	+ 0 49.4	101 23.1	+ 6 59.2	124 16.2	+15 07.1	42 15.9	-15 04.3	53 46.3	122	-17 20.3 - 83
19 19	282 54.4	101 24.8	47.7	116 24.1	58.6	139 18.1	06.9	57 18.2	04.4	68 17.5	122	17 28.6 - 82
20 20	297 56.8	116 24.4	46.5	131 25.1	58.0	154 20.1	06.8	72 20.4	04.4	82 48.7	122	17 36.8 - 81
21 21	312 59.3	131 24.0	.. 45.2	146 26.1	.. 57.3	169 22.1	.. 06.6	87 22.7	.. 04.5	97 19.9	122	-17 44.9 - 81
22 22	328 01.8	146 23.7	43.9	161 27.1	56.7	184 24.1	06.4	102 24.9	04.6	111 51.1	121	17 53.0 - 79
23 23	343 04.2	161 23.3	42.7	176 28.0	56.1	199 26.0	06.3	117 27.2	04.6	126 22.2	122	18 00.9 - 78
20 0	358 06.7	176 22.9	+ 0 41.4	191 29.0	+ 6 55.5	214 28.0	+15 06.1	132 29.4	-15 04.7	140 53.4	121	-18 08.7 - 78
1 1	13 09.2	191 22.5	40.1	206 30.0	54.8	229 30.0	06.0	147 31.6	04.8	155 24.5	121	18 16.5 - 77
2 2	28 11.6	206 22.2	38.9	221 31.0	54.2	244 32.0	05.8	162 33.9	04.8	169 55.6	120	18 24.2 - 75
3 3	43 14.1	221 21.8	.. 37.6	236 32.0	.. 53.6	259 33.9	.. 05.7	177 36.1	.. 04.9	184 26.6	121	-18 31.7 - 75
4 4	58 16.5	236 21.4	36.3	251 33.0	53.0	274 35.9	05.5	192 38.4	05.0	198 57.7	120	18 39.2 - 74
5 5	73 19.0	251 21.0	35.0	266 34.0	52.4	289 37.9	05.4	207 40.6	05.1	213 28.7	120	18 46.6 - 73
6 6	88 21.5	266 20.6	+ 0 33.8	281 34.9	+ 6 51.7	304 39.9	+15 05.2	222 42.9	-15 05.1	227 59.7	120	-18 53.9 - 72
7 7	103 23.9	281 20.3	32.5	296 35.9	51.1	319 41.8	05.1	237 45.1	05.2	242 30.7	120	19 01.1 - 71
8 8	118 26.4	296 19.9	31.2	311 36.9	50.5	334 43.8	04.9	252 47.4	05.3	257 01.7	119	19 08.2 - 70
9 9	133 28.9	311 19.5	.. 30.0	326 37.9	.. 49.9	349 45.8	.. 04.8	267 49.6	.. 05.3	271 32.6	119	-19 15.2 - 69
10 10	148 31.3	326 19.1	28.7	341 38.9	49.2	4 47.8	04.6	282 51.9	05.4	286 03.5	119	19 22.1 - 68
11 11	163 33.8	341 18.8	27.4	356 39.9	48.6	19 49.8	04.5	297 54.1	05.5	300 34.4	119	19 28.9 - 67
12 12	178 36.3	356 18.4	+ 0 26.2	11 40.9	+ 6 48.0	34 51.7	+15 04.3	312 56.3	-15 05.5	315 05.3	119	-19 35.6 - 66
13 13	193 38.7	11 18.0	24.9	26 41.9	47.4	49 53.7	04.2	327 58.6	05.6	329 36.2	118	19 42.2 - 66
14 14	208 41.2	26 17.6	23.6	41 42.8	46.8	64 55.7	04.0	343 00.8	05.7	344 07.0	119	19 48.8 - 64
15 15	223 43.7	41 17.3	.. 22.3	56 43.8	.. 46.1	79 57.7	.. 03.8	358 03.1	.. 05.7	358 37.9	118	-19 55.2 - 63
16 16	238 46.1	56 16.9	21.1	71 44.8	45.5	94 59.6	03.7	13 05.3	05.8	13 08.7	118	20 01.5 - 62
17 17	253 48.6	71 16.5	19.8	86 45.8	44.9	110 01.6	03.5	28 07.6	05.9	27 39.5	117	20 07.7 - 62
18 18	268 51.0	86 16.1	+ 0 18.5	101 46.8	+ 6 44.3	125 03.6	+15 03.4	43 09.8	-15 06.0	42 10.2	118	-20 13.9 - 60
19 19	283 53.5	101 15.8	17.3	116 47.8	43.6	140 05.6	03.2	58 12.0	06.0	56 41.0	117	20 19.9 - 59
20 20	298 56.0	116 15.4	16.0	131 48.8	43.0	155 07.6	03.1	73 14.3	06.1	71 11.7	117	20 25.8 - 58
21 21	313 58.4	131 15.0	.. 14.7	146 49.7	.. 42.4	170 09.5	.. 02.9	88 16.5	.. 06.2	85 42.4	117	-20 31.6 - 58
22 22	329 00.9	146 14.6	13.5	161 50.7	41.8	185 11.5	.. 02.8	103 18.8	06.2	100 13.1	117	20 37.4 - 56
23 23	344 03.4	161 14.3	12.2	176 51.7	41.2	200 13.5	02.6	118 21.0	06.3	114 43.8	117	20 43.0 - 55
21 0	359 05.8	176 13.9	+ 0 10.9	191 52.7	+ 6 40.5	215 15.5	+15 02.5	133 23.3	-15 06.4	129 14.5	116	-20 48.5 - 54
1 1	14 08.3	191 13.5	09.6	206 53.7	39.9	230 17.5	02.3	148 25.5	06.4	143 45.1	117	20 53.9 - 54
2 2	29 10.8	206 13.1	08.4	221 54.7	39.3	245 19.4	02.2	163 27.8	06.5	158 15.8	116	20 59.3 - 52
3 3	44 13.2	221 12.8	.. 07.1	236 55.7	.. 38.7	260 21.4	.. 02.0	178 30.0	.. 06.6	172 46.4	116	21 04.5 - 51
4 4	59 15.7	236 12.4	05.8	251 56.7	38.0	275 23.4	01.9	193 32.2	06.7	187 17.0	115	21 09.6 - 50
5 5	74 18.2	251 12.0	04.6	266 57.6	37.4	290 25.4	01.7	208 34.5	06.7	201 47.5	116	21 14.6 - 49
6 6	89 20.6	266 11.6	+ 0 03.3	281 58.6	+ 6 36.8	305 27.4	+15 01.6	223 36.7	-15 06.8	216 18.1	115	-21 19.5 - 48
7 7	104 23.1	281 11.3	02.0	296 59.6	36.2	320 29.3	01.4	238 39.0	06.9	230 48.6	116	21 24.3 - 47
8 8	119 25.5	296 10.9	+ 0 00.7	312 00.6	35.5	335 31.3	01.3	253 41.2	06.9	245 19.2	115	21 29.0 - 46
9 9	134 28.0	311 10.5	- 0 00.5	327 01.6	.. 34.9	350 33.3	.. 01.1	268 43.4	.. 07.0	259 49.7	115	-21 33.6 - 45
10 10	149 30.5	326 10.1	01.8	342 02.6	34.3	5 35.3	00.9	283 45.7	07.1	274 20.2	115	21 38.1 - 44
11 11	164 32.9	341 09.7	03.1	357 03.6	33.7	20 37.3	00.8	298 47.9	07.2	288 50.7	115	21 42.5 - 43
12 12	179 35.4	356 09.4	- 0 04.3	12 04.6	+ 6 33.0	35 39.2	+15 00.6	313 50.2	-15 07.1	303 21.2	114	-21 46.8 - 42
13 13	194 37.9	11 09.0	05.6	27 05.6	32.4	50 41.2	00.5	328 52.4	07.3	317 51.6	115	21 51.0 - 41
14 14	209 40.3	26 08.6	06.9	42 06.5	31.8	65 43.2	00.3	343 54.7	07.4	332 22.1	114	21 55.1 - 39
15 15	224 42.8	41 08.2	.. 08.2	57 07.5	.. 31.2	80 45.2	.. 00.2	358 56.9	.. 07.4	346 52.5	114	-21 59.0 - 39
16 16	239 45.3	56 07.9	09.4	72 08.5	30.6	95 47.2	15 00.0	13 59.1	07.5	1 22.9	114	22 02.9 - 37
17 17	254 47.7	71 07.5	10.7	87 09.5	29.9	110 49.1	14 59.9	29 01.4	07.6	15 53.3	114	22 06.6 - 37
18 18	269 50.2	86 07.1	- 0 12.0	102 10.5	+ 6 29.3	125 51.1	+14 59.7	44 03.6	-15 07.6	30 23.7	114	-22 10.3 - 35
19 19	284 52.6	101 06.7	13.2	117 11.5	28.7	140 53.1	59.6	59 05.9	07.7	44 54.1	114	22 13.8 - 35
20 20	299 55.1	116 06.4	14.5	132 12.5	28.1	155 55.1	59.4	74 08.1	07.8	59 24.5	113	22 17.3 - 33
21 21	314 57.6	131 06.0	.. 15.8	147 13.5	.. 27.4	170 57.1	.. 59.3	89 10.4	.. 07.8	73 54.8	114	-22 20.6 - 32
22 22	330 00.0	146 05.6	17.1	162 14.4	26.8	185 59.1	59.1	104 12.6	07.9	88 25.2	113	22 23.8 - 31
23 23	345 02.5	161 05.2	18.3	177 15.4	26.2	201 01.0	59.0	119 14.8	08.0	102 55.5	114	22 26.9 - 31
24 24	0 05.0	176 04.9	- 0 19.6	192 16.4	+ 6 25.6	216 03.0	+14 58.8	134 17.1	-15 08.1	117 25.9	113	-22 30.0 - 29
code	-	- 4	- 13	+ 10	- 6	+ 20	- 1	+ 23	- 1			

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS			
	GHA	Dec.	No.	Name	SHA	Dec.								Alt.	Sun's Low'r Limb Add	Venus Add	Mars Add
	h ° '	° '			° '	° '	N °	h m	h m	h m	h m	h m	h m				
19	0	181 27.3 + 1 52.4	7	Acamar	315 50.8	-40 28.5	72	5 26	///	12 44	■	■	■	Alt.			
	1	196 27.5	5	Achernar	335 58.3	-57 27.4	70	5 29	0 44	11 52	■	■	■				
	2	211 27.7	30	Acrux	173 58.5	-62 51.3	68	5 31	1 41	11 21	13 15	■	■				
	3	226 27.9 .. 49.5	19	Adhara	255 46.6	-28 54.4	66	5 33	2 12	10 57	12 36	14 12	15 36				
	4	241 28.1	10	Aldebaran	291 39.0	+16 25.4	64	5 35	2 35	10 39	12 09	13 33	14 44	0			
	5	256 28.4					62	5 36	2 52	10 24	11 48	13 06	14 12	30	0.3	0.1	0.1
	6	271 28.6 + 1 46.6	32	Alioth	166 59.0	+56 12.0	60	5 38	3 06	10 12	11 31	12 45	13 48	45	0.3	0.1	0.0
	7	286 28.8	34	Alkaid	153 33.3	+49 32.1	58	5 39	3 18	10 01	11 17	12 28	13 29	60	0.3	0.1	0.0
	8	301 29.0	55	Al Na'ir	28 37.5	-47 10.5	56	5 40	3 28	9 52	11 05	12 13	13 13	75	0.3	0.0	0.0
	9	316 29.3 .. 43.7	15	Alnilam	276 30.3	-1 13.6	54	5 41	3 36	9 44	10 55	12 01	13 00	90	0.3	0.0	0.0
	10	331 29.5	25	Alphard	218 38.8	-8 27.9	52	5 41	3 44	9 37	10 46	11 50	12 48				
	11	346 29.7					50	5 42	3 50	9 30	10 37	11 40	12 37	Moon's Lower Limb			
	12	1 29.9 + 1 40.8	41	Alphecca	126 47.8	+26 51.9	45	5 44	4 02	9 16	10 20	11 20	12 15	Add			
	13	16 30.1	1	Alpheratz	358 28.0	+28 51.0	40	5 45	4 13	9 04	10 05	11 03	11 58	Alt.	19	20	21
	14	31 30.4	51	Altair	62 50.3	+8 45.2	35	5 46	4 20	8 54	9 53	10 50	11 43	0			
	15	46 30.6 .. 37.9	2	Ankaa	353 57.8	-42 32.5	30	5 47	4 26	8 46	9 42	10 37	11 30	4	13.5	12.9	12.5
	16	61 30.8	42	Antares	113 19.5	-26 20.2	20	5 48	4 35	8 31	9 24	10 17	11 08	8	13.5	12.9	12.5
	17	76 31.0					10	5 49	4 39	8 18	9 09	9 59	10 49	12	13.6	12.9	12.6
	18	91 31.2 + 1 35.0	37	Arcturus	146 35.4	+19 24.8	0	5 50	4 42	8 07	8 54	9 43	10 32	16	13.6	12.9	12.6
	19	106 31.5	43	Atria	109 00.3	-68 57.2	10	5 51	4 42	7 55	8 40	9 26	10 14	20	13.6	13.0	12.6
	20	121 31.7	22	Avior	234 36.2	-59 21.8	20	5 52	4 40	7 42	8 24	9 08	9 55	24	13.6	13.0	12.7
	21	136 31.9 .. 32.1	13	Bellatrix	279 18.4	+6 18.8	30	5 53	4 34	7 28	8 06	8 48	9 33	28	13.7	13.1	12.7
	22	151 32.1	16	Betelge	271 48.1	+7 24.1	35	5 53	4 31	7 19	7 56	8 36	9 21	32	13.7	13.2	12.8
	23	166 32.4					40	5 54	4 25	7 10	7 44	8 23	9 06	36	13.8	13.2	12.9
			17	Canopus	264 15.4	-52 39.9	45	5 54	4 18	6 59	7 31	8 07	8 49	40	13.9	13.3	13.0
			12	Capella	281 38.4	+45 57.2	50	5 55	4 08	6 46	7 14	7 47	8 27	44	13.9	13.4	13.1
			53	Deneb	50 00.7	+45 07.6	52	5 55	4 03	6 40	7 06	7 38	8 17	48	14.0	13.5	13.2
			28	Denebola	183 18.0	+14 49.2	54	5 55	3 58	6 33	6 57	7 28	8 05	52	14.1	13.6	13.4
			4	Diphda	349 38.9	-18 13.5	56	5 56	3 51	6 26	6 48	7 16	7 52	56	14.2	13.7	13.5
							58	5 56	3 44	6 17	6 37	7 02	7 37	60	14.3	13.9	13.6
							60	5 56	3 35	6 08	6 24	6 47	7 19	64	14.4	14.0	13.8
							S							64	14.5	14.1	13.9
														68	14.6	14.3	14.1
														72	14.7	14.4	14.2
														76	14.8	14.5	14.4
														80	14.9	14.7	14.6
														84	15.0	14.8	14.7
														88	15.1	14.9	14.9
														90	Add to table, back cover		
														Moon's Upper Limb			
														Subtract			
														Alt.	19	20	21
														0			
														4	16.7	17.1	17.3
														8	16.7	17.1	17.3
														12	16.7	17.0	17.3
														16	16.7	17.0	17.2
														20	16.6	17.0	17.2
														24	16.6	16.9	17.1
														28	16.6	16.9	17.1
														32	16.5	16.8	17.0
														36	16.4	16.7	16.9
														40	16.4	16.6	16.8
														44	16.3	16.5	16.7
														48	16.2	16.4	16.6
														52	16.1	16.3	16.4
														56	16.1	16.2	16.3
														60	16.0	16.1	16.2
														64	15.9	16.0	16.0
														68	15.8	15.8	15.9
														72	15.7	15.7	15.7
														76	15.6	15.6	15.6
														80	15.4	15.4	15.4
														84	15.3	15.3	15.2
														88	15.2	15.1	15.1
														90	15.1	15.0	14.9
														Subtract from table, back cover			

G M T	T	VENUS - 3.4		MARS 2.0		JUPITER - 1.4		SATURN 0.8		MOON			
	GHA	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
22	0	0 05.0	176 04.9	- 0 19.6	192 16.4	+ 6 25.6	216 03.0	+14 58.8	134 17.1	-15 08.1	117 25.9	113 -22 30.0	- 29
	1	15 07.4	191 04.5	20.9	207 17.4	24.9	231 05.0	58.7	149 19.3	08.1	131 56.2	113 22 32.9	- 27
	2	30 09.9	206 04.1	22.2	222 18.4	24.3	246 07.0	58.5	164 21.6	08.2	146 26.5	113 22 35.6	- 27
	3	45 12.4	221 03.7	23.4	237 19.4	23.7	261 09.0	58.4	179 23.8	08.3	160 56.8	113 22 38.3	- 26
	4	60 14.8	236 03.4	24.7	252 20.4	23.1	276 10.9	58.2	194 26.0	08.3	175 27.1	113 22 40.9	- 25
	5	75 17.3	251 03.0	26.0	267 21.4	22.4	291 12.9	58.1	209 28.3	08.4	189 57.4	113 22 43.4	- 23
	6	90 19.8	266 02.6	- 0 27.2	282 22.4	+ 6 21.8	306 14.9	+14 57.9	224 30.5	-15 08.5	204 27.7	112 -22 45.7	- 23
	7	105 22.2	281 02.2	28.5	297 23.3	21.2	321 16.9	57.7	239 32.8	08.5	218 57.9	113 22 48.0	- 21
	8	120 24.7	296 01.9	29.8	312 24.3	20.6	336 18.9	57.6	254 35.0	08.6	233 28.2	113 22 50.1	- 21
	9	135 27.1	311 01.5	31.1	327 25.3	19.9	351 20.9	57.4	269 37.2	08.7	247 58.5	112 22 52.2	- 19
10	150 29.6	326 01.1	32.3	342 26.3	19.3	6 22.8	57.3	284 39.5	08.8	262 28.7	113 22 54.1	- 18	
	11	165 32.1	341 00.7	33.6	357 27.3	18.7	21 24.8	57.1	299 41.7	08.8	276 59.0	113 22 55.9	- 17
	12	180 34.5	356 00.3	- 0 34.9	12 28.3	+ 6 18.1	36 26.8	+14 57.0	314 44.0	-15 08.9	291 29.3	112 -22 57.6	- 16
	13	195 37.0	11 00.0	36.1	27 29.3	17.4	51 28.8	56.8	329 46.2	09.0	305 59.5	112 22 59.2	- 15
	14	210 39.5	25 59.6	37.4	42 30.3	16.8	66 30.8	56.7	344 48.4	09.0	320 29.7	113 23 00.7	- 14
	15	225 41.9	40 59.2	38.7	57 31.3	16.2	81 32.8	56.5	359 50.7	09.1	335 00.0	112 23 02.1	- 12
	16	240 44.4	55 58.8	40.0	72 32.2	15.5	96 34.8	56.4	14 52.9	09.2	349 30.2	113 23 03.3	- 12
	17	255 46.9	70 58.5	41.2	87 33.2	14.9	111 36.7	56.2	29 55.1	09.2	4 00.5	112 23 04.5	- 11
	18	270 49.3	85 58.1	- 0 42.5	102 34.2	+ 6 14.3	126 38.7	+14 56.1	44 57.4	-15 09.3	18 30.7	112 -23 05.6	- 9
	19	285 51.8	100 57.7	43.8	117 35.2	13.7	141 40.7	55.9	59 59.6	09.4	33 00.9	113 23 06.5	- 8
	20	300 54.3	115 57.3	45.1	132 36.2	13.0	156 42.7	55.8	75 01.9	09.5	47 31.2	112 23 07.3	- 8
	21	315 56.7	130 57.0	46.3	147 37.2	12.4	171 44.7	55.6	90 04.1	09.5	62 01.4	113 23 08.1	- 6
	22	330 59.2	145 56.6	47.6	162 38.2	11.8	186 46.7	55.5	105 06.3	09.6	76 31.7	112 23 08.7	- 5
	23	346 01.6	160 56.2	48.9	177 39.2	11.2	201 48.6	55.3	120 08.6	09.7	91 01.9	112 23 09.2	- 4
23	0	1 04.1	175 55.8	- 0 50.1	192 40.2	+ 6 10.5	216 50.6	+14 55.2	135 10.8	-15 09.7	105 32.1	113 -23 09.6	- 3
	1	16 06.6	190 55.5	51.4	207 41.2	09.9	231 52.6	55.0	150 13.1	09.8	120 02.4	112 23 09.9	- 1
	2	31 09.0	205 55.1	52.7	222 42.1	09.3	246 54.6	54.9	165 15.3	09.9	134 32.6	113 23 10.0	- 1
	3	46 11.5	220 54.7	54.0	237 43.1	08.7	261 56.6	54.7	180 17.5	10.0	149 02.9	112 23 10.1	0
	4	61 14.0	235 54.3	55.2	252 44.1	08.0	276 58.6	54.6	195 19.8	10.0	163 33.1	113 23 10.1	+ 2
	5	76 16.4	250 54.0	56.5	267 45.1	07.4	292 00.6	54.4	210 22.0	10.1	178 03.4	112 23 09.9	+ 2
	6	91 18.9	265 53.6	- 0 57.8	282 46.1	+ 6 06.8	307 02.5	+14 54.3	225 24.2	-15 10.2	192 33.6	113 -23 09.7	+ 4
	7	106 21.4	280 53.2	0 59.0	297 47.1	06.2	322 04.5	54.1	240 26.5	10.2	207 03.9	113 23 09.3	+ 5
	8	121 23.8	295 52.8	1 00.3	312 48.1	05.5	337 06.5	54.0	255 28.7	10.3	221 34.2	113 23 08.8	+ 6
	9	136 26.3	310 52.4	01.6	327 49.1	04.9	352 08.5	53.8	270 31.0	10.4	236 04.5	112 23 08.2	+ 7
10	151 28.7	325 52.1	02.9	342 50.1	04.3	7 10.5	53.7	285 33.2	10.4	250 34.7	113 23 07.5	+ 8	
	11	166 31.2	340 51.7	04.1	357 51.1	03.6	22 12.5	53.5	300 35.4	10.5	265 05.0	113 23 06.7	+ 9
	12	181 33.7	355 51.3	- 1 05.4	12 52.0	+ 6 03.0	37 14.5	+14 53.4	315 37.7	-15 10.6	279 35.3	113 -23 05.8	+ 10
	13	196 36.1	10 50.9	06.7	27 53.0	02.4	52 16.4	53.2	330 39.9	10.7	294 05.6	114 23 04.8	+ 11
	14	211 38.6	25 50.6	08.0	42 54.0	01.8	67 18.4	53.0	345 42.1	10.7	308 36.0	113 23 03.7	+ 13
	15	226 41.1	40 50.2	09.2	57 55.0	01.1	82 20.4	52.9	0 44.4	10.8	323 06.3	113 23 02.4	+ 13
	16	241 43.5	55 49.8	10.5	72 56.0	6 00.5	97 22.4	52.7	15 46.6	10.9	337 36.6	114 23 01.1	+ 15
	17	256 46.0	70 49.4	11.8	87 57.0	5 59.9	112 24.4	52.6	30 48.9	10.9	352 07.0	113 22 59.6	+ 15
	18	271 48.5	85 49.1	- 1 13.0	102 58.0	+ 5 59.3	127 26.4	+14 52.4	45 51.1	-15 11.0	6 37.3	114 -22 58.1	+ 17
	19	286 50.9	100 48.7	14.3	117 59.0	58.6	142 28.4	52.3	60 53.3	11.1	21 07.7	114 22 56.4	+ 18
	20	301 53.4	115 48.3	15.6	133 00.0	58.0	157 30.4	52.1	75 55.6	11.2	35 38.1	113 22 54.6	+ 19
	21	316 55.9	130 47.9	16.9	148 01.0	57.4	172 32.3	52.0	90 57.8	11.2	50 08.4	114 22 52.7	+ 20
	22	331 58.3	145 47.5	18.1	163 02.0	56.7	187 34.3	51.8	106 00.0	11.3	64 38.8	114 22 50.7	+ 21
	23	347 00.8	160 47.2	19.4	178 02.9	56.1	202 36.3	51.7	121 02.3	11.4	79 09.2	115 22 48.6	+ 22
24	0	2 03.2	175 46.8	- 1 20.7	193 03.9	+ 5 55.5	217 38.3	+14 51.5	136 04.5	-15 11.4	93 39.7	114 -22 46.4	+ 23
	1	17 05.7	190 46.4	22.0	208 04.9	54.9	232 40.3	51.4	151 06.7	11.5	108 10.1	115 22 44.1	+ 24
	2	32 08.2	205 46.0	23.2	223 05.9	54.2	247 42.3	51.2	166 09.0	11.6	122 40.6	114 22 41.7	+ 26
	3	47 10.6	220 45.7	24.5	238 06.9	53.6	262 44.3	51.1	181 11.2	11.7	137 11.0	115 22 39.1	+ 27
	4	62 13.1	235 45.3	25.8	253 07.9	53.0	277 46.3	50.9	196 13.4	11.7	151 41.5	115 22 36.5	+ 27
	5	77 15.6	250 44.9	27.0	268 08.9	52.4	292 48.2	50.8	211 15.7	11.8	166 12.0	115 22 33.8	+ 29
	6	92 18.0	265 44.5	- 1 28.3	283 09.9	+ 5 51.7	307 50.2	+14 50.6	226 17.9	-15 11.9	180 42.5	115 -22 30.9	+ 29
	7	107 20.5	280 44.2	29.6	298 10.9	51.1	322 52.2	50.5	241 20.1	11.9	195 13.0	116 22 28.0	+ 31
	8	122 23.0	295 43.8	30.9	313 11.9	50.5	337 54.2	50.3	256 22.4	12.0	209 43.6	115 22 24.9	+ 31
	9	137 25.4	310 43.4	32.1	328 12.9	49.8	352 56.2	50.2	271 24.6	12.1	224 14.1	116 22 21.8	+ 33
10	152 27.9	325 43.0	33.4	343 13.8	49.2	7 58.2	50.0	286 26.9	12.2	238 44.7	116 22 18.5	+ 34	
	11	167 30.4	340 42.6	34.7	358 14.8	48.6	23 00.2	49.9	301 29.1	12.2	253 15.3	116 22 15.1	+ 35
	12	182 32.8	355 42.3	- 1 35.9	13 15.8	+ 5 48.0	38 02.2	+14 49.7	316 31.3	-15 12.3	267 45.9	116 -22 11.6	+ 35
	13	197 35.3	10 41.9	37.2	28 16.8	47.3	53 04.2	49.6	331 33.6	12.4	282 16.5	116 22 08.1	+ 37
	14	212 37.7	25 41.5	38.5	43 17.8	46.7	68 06.1	49.4	346 35.8	12.4	296 47.1	117 22 04.4	+ 38
	15	227 40.2	40 41.1	39.8	58 18.8	46.1	83 08.1	49.3	1 38.0	12.5	311 17.8	117 22 00.6	+ 39
	16	242 42.7	55 40.8	41.0	73 19.8	45.4	98 10.1	49.1	16 40.3	12.6	325 48.5	117 21 56.7	+ 40
	17	257 45.1	70 40.4	42.3	88 20.8	44.8	113 12.1	49.0	31 42.5	12.7	340 19.2	117 21 52.7	+ 41
	18	272 47.6	85 40.0	- 1 43.6	103 21.8	+ 5 44.2	128 14.1	+14 48.8	46 44.7	-15 12.7	354 49.9	117 -21 48.6	+ 42
	19	287 50.1	100 39.6	44.9	118 22.8	43.6	143 16.1	48.7	61 47.0	12.8	9 20.6	118 21 44.4	+ 43
	20	302 52.5	115 39.2	46.1	133 23.8	42.9	158 18.1	48.5	76 49.2	12.9	23 51.4	117 21 40.1	+ 44
	21	317 55.0	130 38.9	47.4	148 24.8	42.3	173 20.1	48.4	91 51.4	12.9	38 22.1	118 21 35.7	+ 45
	22	332 57.5	145 38.5	48.7	163 25.7	41.7	188 22.1	48.2	106 53.7	13.0	52 52.9	118 21 31.2	+ 46
	23	347 59.9	160 38.1	49.9	178 26.7	41.0	203 24.1	48.1	121 55.9	13.1	67 23.7	119 21 26	

G M T	SUN		STARS				Lat.	Sunrise	Twilt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.	No.	Name	SHA	Dec.				22	23	24	25	Alt.	Sun's Low'r Limb Add	Venus Add	Mars Add		
h	°	'					N	h	m	h	m	h	m	h	m				
22	0	181 43.2 + 0 42.5	7	Acamar	315 50.8 - 40 28.6	72	5 39		■	■	■	■	■	18 28					
	1	196 43.4	41.5	5 Achernar	335 58.3 - 57 27.4	70	5 41	1 24	■	■	■	■	■	17 19					
	2	211 43.6	40.6	30 Acrux	173 58.5 - 62 51.3	68	5 42	2 02	■	■	■	■	■	16 42					
	3	226 43.8	39.6	19 Adhara	255 46.6 - 28 54.4	66	5 43	2 29	15 36	16 24	16 38	16 42							
	4	241 44.0	38.6	10 Aldebaran	291 38.9 + 16 25.4	64	5 43	2 49	14 44	15 33	16 01	16 16							
	5	256 44.3	37.7			62	5 44	3 03	14 12	15 02	15 35	15 56							
	6	271 44.5 + 0 36.7		32 Alioth	166 59.1 + 56 12.0	60	5 45	3 16	13 48	14 38	15 14	15 39							
	7	286 44.7	35.7	34 Alkaid	153 33.3 + 49 32.1	58	5 45	3 26	13 29	14 19	14 57	15 25							
	8	301 44.9	34.7	55 Al Na'ir	28 37.5 - 47 10.5	56	5 46	3 36	13 13	14 03	14 43	15 13							
	9	316 45.1	33.8	15 Alnilam	276 30.2 - 1 13.6	54	5 46	3 43	13 00	13 50	14 30	15 02							
	10	331 45.4	32.8	25 Alphard	218 38.8 - 8 27.9	52	5 46	3 50	12 48	13 38	14 19	14 53							
	11	346 45.6	31.8			50	5 47	3 55	12 37	13 27	14 09	14 45							
	12	1 45.8 + 0 30.8		41 Alphecca	126 47.8 + 26 51.9	45	5 47	4 07	12 15	13 05	13 49	14 27							
	13	16 46.0	29.9	1 Alpheratz	358 28.0 + 28 51.0	40	5 48	4 16	11 58	12 48	13 32	14 12							
	14	31 46.2	28.9	51 Altair	62 50.3 + 8 45.2	35	5 48	4 22	11 43	12 33	13 18	13 59							
	15	46 46.5	27.9	2 Ankaa	353 57.8 - 42 32.5	30	5 48	4 28	11 30	12 20	13 06	13 48							
	16	61 46.7	27.0	42 Antares	113 19.5 - 26 20.2	20	5 49	4 36	11 08	11 58	12 45	13 30							
	17	76 46.9	26.0			10	5 49	4 39	10 49	11 39	12 27	13 13							
	18	91 47.1 + 0 25.0		37 Arcturus	146 35.4 + 19 24.8	0	5 49	4 41	10 32	11 21	12 10	12 58							
	19	106 47.3	24.0	43 Atria	109 00.4 - 68 57.2	10	5 49	4 40	10 14	11 03	11 53	12 42							
	20	121 47.6	23.1	22 Avior	234 36.1 - 59 21.8	20	5 49	4 37	9 55	10 44	11 34	12 26							
	21	136 47.8	22.1	13 Bellatrix	279 18.4 + 6 18.8	30	5 49	4 31	9 33	10 22	11 13	12 07							
	22	151 48.0	21.1	16 Betelge'se	271 48.1 + 7 24.1	35	5 49	4 26	9 21	10 09	11 01	11 56							
	23	166 48.2	20.1			40	5 49	4 20	9 06	9 54	10 47	11 43							
				17 Canopus	264 15.4 - 52 39.9	45	5 49	4 12	8 49	9 36	10 30	11 28							
				12 Capella	281 38.3 + 45 57.2	50	5 49	4 01	8 27	9 15	10 09	11 10							
				53 Deneb	50 00.7 + 45 07.6	52	5 48	3 56	8 17	9 04	9 59	11 01							
				28 Denebola	183 18.0 + 14 49.2	54	5 48	3 50	8 05	8 52	9 48	10 51							
				4 Diphda	349 38.9 - 18 13.5	56	5 48	3 43	7 52	8 39	9 35	10 40							
						58	5 48	3 35	7 37	8 23	9 20	10 27							
				27 Dubhe	194 45.2 + 61 59.3	60	5 48	3 25	7 19	8 04	9 03	10 12							
				14 Elnath	279 07.3 + 28 34.3	S													
				47 Eltanin	91 06.3 + 51 29.9														
				54 Enif	34 29.3 + 9 40.5														
				56 Fomalhaut	16 11.3 - 29 51.3														
				31 Gacrux	172 49.8 - 56 52.0	72	18 03		■	■	■	■							
				29 Gienah	176 37.2 - 17 17.8	70	18 02	22 09	■	■	■	■	20 02						
				35 Hadar	149 50.0 - 60 09.8	68	18 01	21 34	■	■	■	■	21 10						
				6 Hamal	328 49.3 + 23 15.4	66	18 01	21 10	17 49	18 44	20 10	21 46							
				48 Kaus Aust.	84 41.1 - 34 24.5	64	18 00	20 51	18 41	19 34	20 47	22 12							
						62	18 00	20 37	19 13	20 06	21 14	22 31							
				40 Kochab	137 18.7 + 74 20.4	60	17 59	20 25	19 37	20 29	21 34	22 48							
				57 Markab	14 21.1 + 14 58.3	58	17 59	20 15	19 56	20 48	21 51	23 01							
				8 Menkar	315 00.1 + 3 55.2	56	17 58	20 06	20 12	21 04	22 05	23 13							
				36 Menkent	148 59.0 - 36 09.3	54	17 58	19 59	20 26	21 17	22 17	23 23							
				24 Miapl'dus	221 49.7 - 69 31.9	52	17 58	19 53	20 38	21 29	22 28	23 32							
						50	17 58	19 48	20 48	21 39	22 37	23 40							
				9 Mirfak	309 42.1 + 49 42.3	45	17 57	19 36	21 10	22 01	22 57	23 57							
				50 Nunki	76 51.8 - 26 21.2	40	17 57	19 28	21 28	22 19	23 13	24 11							
				52 Peacock	54 26.9 - 56 52.8	35	17 57	19 22	21 43	22 33	23 27	24 23							
				21 Pollux	244 20.7 + 28 08.0	30	17 56	19 16	21 56	22 46	23 39	24 34							
				20 Procyon	245 45.1 + 5 20.4	20	17 56	19 09	22 18	23 08	23 59	24 51							
						10	17 56	19 06	22 38	23 27	24 17	0 17							
				46 R'alhague	96 46.6 + 12 35.7	0	17 56	19 05	22 55	23 44	24 33	0 33							
				26 Regulus	208 29.8 + 12 11.1	10	17 56	19 06	23 13	24 02	0 02	0 49							
				11 Rigel	281 53.6 - 8 14.9	20	17 56	19 09	23 32	24 21	0 21	1 07							
				38 Rigel Kent.	140 51.5 - 60 39.4	30	17 56	19 16	23 54	24 42	0 42	1 27							
				44 Sabik	103 02.2 - 15 40.3	35	17 57	19 22	24 07	0 07	0 55	1 38							
						40	17 57	19 28	24 22	0 22	1 09	1 51							
				3 Schedar	350 29.4 + 56 17.8	45	17 57	19 36	24 40	0 40	1 27	2 07							
				45 Shaula	97 20.7 - 37 04.5	50	17 58	19 48	0 08	1 02	1 48	2 26							
				18 Sirius	259 11.9 - 16 39.0	52	17 58	19 53	0 18	1 12	1 58	2 35							
				33 Spica	159 17.2 - 10 55.8	54	17 58	19 59	0 30	1 24	2 09	2 46							
				23 Suhail	223 24.6 - 43 15.0	56	17 58	20 06	0 43	1 38	2 22	2 57							
						58	17 59	20 16	0 58	1 53	2 37	3 10							
				49 Vega	81 08.2 + 38 44.8	60	17 59	20 25	1 16	2 12	2 55	3 26							
				39 Zub'g'bi	137 53.6 - 15 51.5	S													
				Equation of Time (App. Mean)				GMT of Transit											
								Meridian of Greenwich											

G M T	T	VENUS — 3.4		MARS 2.0		JUPITER — 1.4		SATURN 0.8		MOON			
	GHA	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
h	°	°	°	°	°	°	°	°	°	°	°	°	°
25	0	3 02.4	175 37.7	- 1 51.2	193 27.7	+ 5 40.4	218 26.0	+14 47.9	136 58.1	-15 13.2	81 54.6	118 -21 21.9 + 49	
	1	18 04.8	190 37.4	52.5	208 28.7	39.8	233 28.0	47.8	152 00.4	13.2	96 25.4	119 21 17.0 + 49	
	2	33 07.3	205 37.0	53.8	223 29.7	39.2	248 30.0	47.6	167 02.6	13.3	110 56.3	119 21 12.1 + 50	
	3	48 09.8	220 36.6	55.0	238 30.7	38.5	263 32.0	47.5	182 04.8	13.4	125 27.2	119 +21 07.1 + 51	
	4	63 12.2	235 36.2	56.3	253 31.7	37.9	278 34.0	47.3	197 07.1	13.4	139 58.1	119 21 02.0 + 52	
	5	78 14.7	250 35.8	57.6	268 32.7	37.3	293 36.0	47.2	212 09.3	13.5	154 29.0	120 20 56.8 + 53	
	6	93 17.2	265 35.5	- 1 58.8	283 33.7	+ 5 36.6	308 38.0	+14 47.0	227 11.5	-15 13.6	169 00.0	119 -20 51.5 + 54	
	7	108 19.6	280 35.1	2 00.1	298 34.7	36.0	323 40.0	46.9	242 13.8	13.7	183 30.9	120 20 46.1 + 55	
	8	123 22.1	295 34.7	01.4	313 35.7	35.4	338 42.0	46.7	257 16.0	13.7	198 01.9	121 20 40.6 + 56	
	9	138 24.6	310 34.3	02.7	328 36.7	34.7	353 44.0	46.6	272 18.2	13.8	212 33.0	120 +20 35.0 + 57	
	10	153 27.0	325 33.9	03.9	343 37.7	34.1	8 46.0	46.4	287 20.5	13.9	227 04.0	121 20 29.3 + 58	
	11	168 29.5	340 33.6	05.2	358 38.6	33.5	23 48.0	46.3	302 22.7	13.9	241 35.1	120 20 23.5 + 59	
	12	183 32.0	355 33.2	- 2 06.5	13 39.6	+ 5 32.9	38 50.0	+14 46.1	317 24.9	-15 14.0	256 06.1	121 -20 17.6 + 60	
	13	198 34.4	10 32.8	07.7	28 40.6	32.2	53 51.9	46.0	332 27.2	14.1	270 37.2	122 20 11.6 + 61	
	14	213 36.9	25 32.4	09.0	43 41.6	31.6	68 53.9	45.8	347 29.4	14.2	285 08.4	121 20 05.5 + 62	
	15	228 39.3	40 32.0	10.3	58 42.6	31.0	83 55.9	45.7	2 31.6	14.2	299 39.5	122 +19 59.3 + 63	
	16	243 41.8	55 31.7	11.6	73 43.6	30.3	98 57.9	45.5	17 33.8	14.3	314 10.7	122 19 53.0 + 63	
	17	258 44.3	70 31.3	12.8	88 44.6	29.7	113 59.9	45.4	32 36.1	14.4	328 41.9	122 19 46.7 + 65	
	18	273 46.7	85 30.9	- 2 14.1	103 45.6	+ 5 29.1	129 01.9	+14 45.2	47 38.3	-15 14.4	343 13.1	122 -19 40.2 + 66	
	19	288 49.2	100 30.5	15.4	118 46.6	28.4	144 03.9	45.1	62 40.5	14.5	357 44.3	123 19 33.6 + 66	
	20	303 51.7	115 30.1	16.6	133 47.6	27.8	159 05.9	44.9	77 42.8	14.6	12 15.6	123 19 27.0 + 68	
	21	318 54.1	130 29.8	17.9	148 48.6	27.2	174 07.9	44.8	92 45.0	14.7	26 46.9	123 +19 20.2 + 68	
	22	333 56.6	145 29.4	19.2	163 49.6	26.6	189 09.9	44.6	107 47.2	14.7	41 18.2	123 19 13.4 + 69	
	23	348 59.1	160 29.0	20.5	178 50.6	25.9	204 11.9	44.5	122 49.5	14.8	55 49.5	124 19 06.5 + 71	
26	0	4 01.5	175 28.6	- 2 21.7	193 51.6	+ 5 25.3	219 13.9	+14 44.3	137 51.7	-15 14.9	70 20.9	123 -18 59.4 + 71	
	1	19 04.0	190 28.3	23.0	208 52.5	24.7	234 15.9	44.2	152 53.9	14.9	84 52.2	124 18 52.3 + 72	
	2	34 06.5	205 27.9	24.3	223 53.5	24.0	249 17.9	44.0	167 56.2	15.0	99 23.6	124 18 45.1 + 73	
	3	49 08.9	220 27.5	25.5	238 54.5	23.4	264 19.9	43.9	182 58.4	15.1	113 55.0	125 -18 37.8 + 74	
	4	64 11.4	235 27.1	26.8	253 55.5	22.8	279 21.8	43.7	198 00.6	15.2	128 26.5	124 18 30.4 + 75	
	5	79 13.8	250 26.7	28.1	268 56.5	22.1	294 23.8	43.6	213 02.8	15.2	142 57.9	125 18 22.9 + 75	
	6	94 16.3	265 26.3	- 2 29.3	283 57.5	+ 5 21.5	309 25.8	+14 43.4	228 05.1	-15 15.3	157 29.4	125 -18 15.4 + 77	
	7	109 18.8	280 26.0	30.6	298 58.5	20.9	324 27.8	43.3	243 07.3	15.4	172 00.9	125 18 07.7 + 77	
	8	124 21.2	295 25.6	31.9	313 59.5	20.2	339 29.8	43.1	258 09.5	15.5	186 32.4	126 18 00.0 + 79	
	9	139 23.7	310 25.2	33.2	329 00.5	19.6	354 31.8	43.0	273 11.8	15.5	201 04.0	125 -17 52.1 + 79	
	10	154 26.2	325 24.8	34.4	344 01.5	19.0	9 33.8	42.8	288 14.0	15.6	215 35.5	126 17 44.2 + 80	
	11	169 28.6	340 24.4	35.7	359 02.5	18.4	24 35.8	42.7	303 16.2	15.7	230 07.1	126 17 36.2 + 81	
	12	184 31.1	355 24.1	- 2 37.0	14 03.5	+ 5 17.7	39 37.8	+14 42.5	318 18.5	-15 15.7	244 38.7	126 -17 28.1 + 82	
	13	199 33.6	10 23.7	38.2	29 04.5	17.1	54 39.8	42.4	333 20.7	15.8	259 10.3	127 17 19.9 + 82	
	14	214 36.0	25 23.3	39.5	44 05.5	16.5	69 41.8	42.2	348 22.9	15.9	273 42.0	127 17 11.7 + 84	
	15	229 38.5	40 22.9	40.8	59 06.5	15.8	84 43.8	42.1	3 25.1	16.0	288 13.7	126 -17 03.3 + 84	
	16	244 40.9	55 22.5	42.0	74 07.4	15.2	99 45.8	41.9	18 27.4	16.0	302 45.7	127 16 54.9 + 85	
	17	259 43.4	70 22.2	43.3	89 08.4	14.6	114 47.8	41.8	33 29.6	16.1	317 17.0	128 16 46.4 + 86	
	18	274 45.9	85 21.8	- 2 44.6	104 09.4	+ 5 13.9	129 49.8	+14 41.6	48 31.8	-15 16.2	331 48.8	127 -16 37.8 + 87	
	19	289 48.3	100 21.4	45.9	119 10.4	13.3	144 51.8	41.5	63 34.1	16.3	346 20.5	128 16 29.1 + 88	
	20	304 50.8	115 21.0	47.1	134 11.4	12.7	159 53.8	41.3	78 36.3	16.3	0 52.3	127 16 20.3 + 88	
	21	319 53.3	130 20.6	48.4	149 12.4	12.0	174 55.8	41.2	93 38.5	16.4	15 24.0	128 -16 11.5 + 89	
	22	334 55.7	145 20.2	49.7	164 13.4	11.4	189 57.8	41.0	108 40.7	16.5	29 55.8	129 16 02.6 + 91	
	23	349 58.2	160 19.9	50.9	179 14.4	10.8	204 59.8	40.9	123 43.0	16.5	44 27.7	128 15 53.5 + 90	
27	0	5 00.7	175 19.5	- 2 52.2	194 15.4	+ 5 10.1	220 01.8	+14 40.7	138 45.2	-15 16.6	58 59.5	128 -15 44.5 + 92	
	1	20 03.1	190 19.1	53.5	209 16.4	09.5	235 03.8	40.6	153 47.4	16.7	73 31.3	129 15 35.3 + 93	
	2	35 05.6	205 18.7	54.7	224 17.4	08.9	250 05.8	40.4	168 49.7	16.8	88 03.2	129 15 26.0 + 93	
	3	50 08.1	220 18.3	56.0	239 18.4	08.3	265 07.7	40.3	183 51.9	16.8	102 35.1	129 -15 16.7 + 94	
	4	65 10.5	235 18.0	57.3	254 19.4	07.6	280 09.7	40.1	198 54.1	16.9	117 07.0	129 15 07.3 + 95	
	5	80 13.0	250 17.6	58.5	269 20.4	07.0	295 11.7	40.0	213 56.3	17.0	131 38.9	129 14 57.8 + 95	
	6	95 15.4	265 17.2	- 2 59.8	284 21.4	+ 5 06.4	310 13.7	+14 39.8	228 58.6	-15 17.0	146 10.8	130 -14 48.3 + 97	
	7	110 17.9	280 16.8	3 01.1	299 22.4	05.7	325 15.7	39.7	244 00.8	17.1	160 42.8	129 14 38.6 + 97	
	8	125 20.4	295 16.4	02.4	314 23.3	05.1	340 17.7	39.5	259 03.0	17.2	175 14.7	130 14 28.9 + 98	
	9	140 22.8	310 16.0	03.6	329 24.3	04.5	355 19.7	39.4	274 05.3	17.3	189 46.7	130 -14 19.1 + 98	
	10	155 25.3	325 15.7	04.9	344 25.3	03.8	10 21.7	39.2	289 07.5	17.3	204 18.7	130 14 09.3 + 99	
	11	170 27.8	340 15.3	06.2	359 26.3	03.2	25 23.7	39.1	304 09.7	17.4	218 50.7	130 13 59.4 + 100	
	12	185 30.2	355 14.9	- 3 07.4	14 27.3	+ 5 02.6	40 25.7	+14 38.9	319 11.9	-15 17.5	233 22.7	131 -13 49.4 + 101	
	13	200 32.7	10 14.5	08.7	29 28.3	01.9	55 27.7	38.8	334 14.2	17.6	247 54.8	130 13 39.3 + 102	
	14	215 35.2	25 14.1	10.0	44 29.3	01.3	70 29.7	38.6	349 16.4	17.6	262 26.8	130 13 29.1 + 102	
	15	230 37.6	40 13.7	11.2	59 30.3	00.7	85 31.7	38.5	4 18.6	17.7	276 58.8	131 -13 18.9 + 103	
	16	245 40.1	55 13.4	12.5	74 31.3	5 00.0	100 33.7	38.3	19 20.8	17.8	291 30.9	131 13 08.6 + 103	
	17	260 42.6	70 13.0	13.8	89 32.3	4 59.4	115 35.7	38.2	34 23.1	17.8	306 03.0	131 12 58.3 + 105	
	18	275 45.0	85 12.6	- 3 15.0	104 33.3	+ 4 58.8	130 37.7	+14 38.0	49 25.3	-15 17.9	320 35.1	131 -12 47.8 + 105	
	19	290 47.5	100 12.2	16.3	119 34.3	58.1	145 39.7	37.9	64 27.5	18.0	335 07.2	131 12 37.3 + 105	
	20	305 49.9	115 11.8	17.6	134 35.3	57.5	160 41.7	37.7	79 29.8	18.1	349 39.3	131 12 26.8 + 107	
	21	320 52.4	130 11.4	18.8	149 36.3	56.9	175 43.7	37.6	94 32.0	18.1	4 11.4	131 -12 16.1 + 107	
	22	335 54.9	145 11.0	20.1	164 37.3	56.2	190 45.7	37.4	109 34.2	18.2	18 43.5	131 12 05.4 + 107	
	23	350 57.3	160 10.7	21.4	179 38.3	55.6	205 47.7	37.3	124 36.4	18.3	33 15.6	132 11 54.7 + 109	
24	5 59.8	175 10.5											

25

0

181 58.9 -

0 27.6

1

196 59.1

28.6

2

211 59.3

29.5

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226 59.6 ..

30.5

4

241 59.8

31.5

5

257 00.0

32.4

6

272 00.2 -

0 33.4

7

287 00.4

34.4

8

302 00.6

35.4

9

317 00.9 ..

36.3

10

332 01.1

37.3

11

347 01.3

38.3

12

2 01.5 -

0 39.3

13

17 01.7

40.2

14

32 01.9

41.2

15

47 02.2 ..

42.2

16

62 02.4

43.2

17

77 02.6

44.1

18

92 02.8 -

0 45.1

19

107 03.0

46.1

20

122 03.2

47.1

21

137 03.4 ..

48.0

22

152 03.7

49.0

23

167 03.9

50.0

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182 04.1 -

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197 04.3

51.9

2

212 04.5

52.9

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227 04.7 ..

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54.9

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55.8

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272 05.4 -

0 56.8

7

287 05.6

57.8

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302 05.8

58.8

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317 06.0

0 59.7

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332 06.2

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03.6

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32 07.1

04.6

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62 07.5

06.5

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92 08.0 -

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107 08.2

09.5

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122 08.4

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152 08.8

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182 09.2 -

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197 09.5

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2

212 09.7

16.3

3

227 09.9 ..

17.3

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242 10.1

18.2

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257 10.3

19.2

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272 10.5 -

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287 10.7

21.2

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302 11.0

22.1

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317 11.2 ..

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27.0

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28.0

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77 12.9

30.9

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107 13.3

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167 14.1

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182 14.4 -

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197 14.6

38.6

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212 14.8

39.5

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227 15.0 ..

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41.3

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257 15.4

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287 15.8

44.0

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302 16.0

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32 17.2

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92 18.0 -

1 53.9

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107 18.2

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122 18.4

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137 18.6 ..

56.6

22

152 18.8

57.5

23

167 19.0

58.4

No.

Name

SHA

Dec.

7

Acamar

315 50.8

-40 28.6

5

Achernar

335 58.3

-57 27.4

30

Acrux

173 58.5

-62 51.3

19

Adhara

255 46.6

-28 54.4

10

Aldebaran

291 38.9

+16 25.4

32

Alioth

166 59.1

+56 12.0

34

Alkaid

153 33.3

+49 32.1

55

Al Na'ir

28 37.5

-47 10.5

15

Alnilam

276 30.2

-1 13.6

25

Alphard

218 38.8

-8 27.9

41

Alphecca

126 47.8

+26 51.9

1

Alpheratz

358 28.0

+28 51.0

51

Altair

62 50.3

+8 45.2

2

Ankaa

353 57.8

-42 32.5

42

Antares

113 19.5

-26 20.2

37

Arcturus

146 35.4

+19 24.8

43

Atria

109 00.4

-68 57.2

22

Avior

234 36.1

-59 21.8

13

Bellatrix

279 18.3

+6 18.8

16

Betelge'se

271 48.1

+7 24.1

17

Canopus

264 15.4

-52 39.9

12

Capella

281 38.3

+45 57.2

53

Deneb

50 00.7

+45 07.6

28

Denebola

183 18.0

+14 49.2

4

Diphda

349 38.9

-18 13.5

27

Dubhe

194 45.2

+61 59.3

14

Elnath

279 07.2

+28 34.3

47

Eltanin

91 06.3

+51 29.9

54

Enif

34 29.3

+9 40.5

56

Fomalhaut

16 11.3

-29 51.3

31

Gacrux

172 49.8

-56 52.0

29

Gienah

176 37.2

-17 17.8

35

Hadar

149 50.0

-60 09.8

6

Hamal

328 49.3

+23 15.4

48

Kaus Aust.

84 41.1

-34 24.5

40

Kochab

137 18.8

+74 20.3

57

Markab

14 21.1

+14 58.3

8

Menkar

315 00.1

+3 55.2

36

Menkent

148 59.0

-36 09.3

24

Miapl'dus

221 49.7

-69 31.9

9

Mirfak

309 42.0

+49 42.3

50

Nunki

76 51.8

-26 21.2

52

Peacock

54 26.9

-56 52.8

21

Pollux

244 20.7

+28 08.0

20

Procyon

245 45.1

+5 20.4

46

R'alhague

96 46.7

+12 35.7

26

Regulus

208 29.8

+12 11.1

11

Rigel

281 53.5

-8 14.9

38

Rigil Kent.

140 51.5

-60 39.4

44

Sabik

103 02.3

-15 40.3

3

Schedar

350 29.4

+56 17.9

45

Shaula

97 20.7

-37 04.5

18

Sirius

259 11.9

-16 39.0

33

Spica

159 17.2

-10 55.8

23

Suhail

223 24.6

-43 15.0

49

Vega

81 08.2

+38 44.8

39

Zub'g'bi

137 53.6

-15 51.5

Lat.

Sunrise

Twit. begins

N

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Alt.

Sun's Low'r Limb Add

Venus Add

Mars Add

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Alt.

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DAY

Moon

Venus

Mars

Jupiter

Saturn

25

26

27

28

h m

h m

h m

h m

h m

h m

DAY

Moon

Venus

Mars

Jupiter

Saturn

25

26

27

28

h m

h m

h m

h m

h m

h m

Day of Atonement (Yom Kippur)

26

G M T	T		VENUS - 3.4		MARS 2.0		JUPITER - 1.4		SATURN 0.8		MOON				
	GHA		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code	
h	°	'	°	'	°	'	°	'	°	'	°	'	°	'	
28	0	5 59.8	175 10.3	- 3 22.6	194 39.3	+ 4 55.0	220 49.7	+14 37.1	139 38.7	-15 18.4	47 47.8	131	-11 43.8	+109	
	1	21 02.3	190 09.9		23.9	209 40.3	54.3	235 51.7		37.0	154 40.9		18.4	62 19.9 132 11 32.9 +109	
	2	36 04.7	205 09.5		25.2	224 41.2	53.7	250 53.7		36.8	169 43.1		18.5	76 52.1 131 11 22.0 +111	
	3	51 07.2	220 09.1	..	26.4	239 42.2	..	53.1	265 55.7	..	36.7	184 45.3	..	18.6	91 24.2 132 -11 10.9 +111
	4	66 09.7	235 08.7		27.7	254 43.2	52.4	280 57.7		36.6	199 47.6		18.6	105 56.4 132 10 59.8 +111	
	5	81 12.1	250 08.4		29.0	269 44.2	51.8	295 59.7		36.4	214 49.8		18.7	120 28.6 131 10 48.7 +112	
	6	96 14.6	265 08.0	- 3 30.2	284 45.2	+ 4 51.2	311 01.7	+14 36.3	229 52.0	-15 18.8	135 00.7	132	-10 37.5	+113	
	7	111 17.0	280 07.6		31.5	299 46.2	50.5	326 03.7		36.1	244 54.2		18.9	149 32.9 132 10 26.2 +113	
	8	126 19.5	295 07.2		32.8	314 47.2	49.9	341 05.7		36.0	259 56.5		18.9	164 05.1 132 10 14.9 +114	
	9	141 22.0	310 06.8	..	34.0	329 48.2	..	49.3	356 07.7	..	35.8	274 58.7	..	19.0	178 37.3 131 -10 03.5 +115
	10	156 24.4	325 06.4		35.3	344 49.2	48.6	11 09.7		35.7	290 00.9		19.1	193 09.4 132 9 52.0 +115	
	11	171 26.9	340 06.0		36.6	359 50.2	48.0	26 11.7		35.5	305 03.1		19.2	207 41.6 132 9 40.5 +115	
	12	186 29.4	355 05.7	- 3 37.8	14 51.2	+ 4 47.4	41 13.7	+14 35.4	320 05.4	-15 19.2	222 13.8	132	-9 29.0	+116	
	13	201 31.8	10 05.3		39.1	29 52.2	46.7	56 15.7		35.2	335 07.6		19.3	236 46.0 132 9 17.4 +117	
	14	216 34.3	25 04.9		40.4	44 53.2	46.1	71 17.7		35.1	350 09.8		19.4	251 18.2 131 9 05.7 +117	
	15	231 36.8	40 04.5	..	41.6	59 54.2	..	45.5	86 19.7	..	34.9	5 12.0	..	19.5	265 50.3 132 -8 54.0 +118
	16	246 39.2	55 04.1		42.9	74 55.2	44.8	101 21.7		34.8	20 14.3		19.5	280 22.5 132 8 42.2 +119	
	17	261 41.7	70 03.7		44.2	89 56.2	44.2	116 23.7		34.6	35 16.5		19.6	294 54.7 132 8 30.3 +119	
	18	276 44.2	85 03.3	- 3 45.4	104 57.2	+ 4 43.6	131 25.7	+14 34.5	50 18.7	-15 19.7	309 26.9	131	-8 18.4	+119	
	19	291 46.6	100 02.9		46.7	119 58.2	42.9	146 27.7		34.3	65 20.9		19.7	323 59.0 132 8 06.5 +120	
	20	306 49.1	115 02.6		48.0	134 59.2	42.3	161 29.7		34.2	80 23.2		19.8	338 31.2 132 7 54.5 +120	
	21	321 51.5	130 02.2	..	49.2	150 00.2	..	41.7	176 31.8	..	34.0	95 25.4	..	19.9	353 03.4 131 -7 42.5 +121
	22	336 54.0	145 01.8		50.5	165 01.1	41.0	191 33.8		33.9	110 27.6		20.0	7 35.5 132 7 30.4 +122	
	23	351 56.5	160 01.4		51.8	180 02.1	40.4	206 35.8		33.7	125 29.8		20.0	22 07.7 131 7 18.2 +121	
29	0	6 58.9	175 01.0	- 3 53.0	195 03.1	+ 4 39.8	221 37.8	+14 33.6	140 32.1	-15 20.1	36 39.8	131	-7 06.1	+123	
	1	22 01.4	190 00.6		54.3	210 04.1		39.1	236 39.8		33.4	155 34.3		20.2	51 11.9 131 6 53.8 +122
	2	37 03.9	205 00.2		55.5	225 05.1		38.5	251 41.8		33.3	170 36.5		20.3	65 44.0 132 6 41.6 +124
	3	52 06.3	219 59.8	..	56.8	240 06.1	..	37.9	266 43.8	..	33.1	185 38.7	..	20.3	80 16.2 131 -6 29.2 +123
	4	67 08.8	234 59.5		58.1	255 07.1		37.2	281 45.8		33.0	200 40.9		20.4	94 48.3 130 6 16.9 +124
	5	82 11.3	249 59.1	3 59.3	270 08.1		36.6	296 47.8		32.8	215 43.2		20.5	109 20.3 131 6 04.5 +125	
	6	97 13.7	264 58.7	- 4 00.6	285 09.1	+ 4 36.0	311 49.8	+14 32.7	230 45.4	-15 20.5	123 52.4	131	-5 52.0	+125	
	7	112 16.2	279 58.3		01.9	300 10.1		35.3	326 51.8		32.6	245 47.6		20.6	138 24.5 130 5 39.5 +125
	8	127 18.7	294 57.9		03.1	315 11.1		34.7	341 53.8		32.4	260 49.8		20.7	152 56.5 131 5 27.0 +126
	9	142 21.1	309 57.5	..	04.4	330 12.1	..	34.1	356 55.8	..	32.3	275 52.1	..	20.8	167 28.6 130 -5 14.4 +126
	10	157 23.6	324 57.1		05.7	345 13.1		33.4	11 57.8		32.1	290 54.3		20.8	182 00.6 130 5 01.8 +126
	11	172 26.0	339 56.7		06.9	0 14.1		32.8	26 59.8		32.0	305 56.5		20.9	196 32.6 130 4 49.2 +127
	12	187 28.5	354 56.3	- 4 08.2	15 15.1	+ 4 32.2	42 01.8	+14 31.8	320 58.7	-15 21.0	211 04.6	130	-4 36.5	+127	
	13	202 31.0	9 56.0		09.4	30 16.1		31.5	57 03.8		31.7	336 01.0		21.1	225 36.6 129 4 23.8 +128
	14	217 33.4	24 55.6		10.7	45 17.1		30.9	72 05.8		31.5	351 03.2		21.1	240 08.5 130 4 11.0 +128
	15	232 35.9	39 55.2	..	12.0	60 18.1	..	30.2	87 07.8	..	31.4	6 05.4	..	21.2	254 40.5 129 -3 58.2 +128
	16	247 38.4	54 54.8		13.2	75 19.1		29.6	102 09.8		31.2	21 07.6		21.3	269 12.4 129 3 45.4 +129
	17	262 40.8	69 54.4		14.5	90 20.1		29.0	117 11.8		31.1	36 09.8		21.4	283 44.3 129 3 32.5 +129
	18	277 43.3	84 54.0	- 4 15.8	105 21.1	+ 4 28.3	132 13.8	+14 30.9	51 12.1	-15 21.4	298 16.2	128	-3 19.6	+129	
	19	292 45.8	99 53.6		17.0	120 22.1		27.7	147 15.8		30.8	66 14.3		21.5	312 48.0 129 3 06.7 +129
	20	307 48.2	114 53.2		18.3	135 23.1		27.1	162 17.8		30.6	81 16.5		21.6	327 19.9 128 2 53.8 +130
	21	322 50.7	129 52.8	..	19.5	150 24.1	..	26.4	177 19.9	..	30.5	96 18.7	..	21.7	341 51.7 128 -2 40.8 +130
	22	337 53.1	144 52.4		20.8	165 25.1		25.8	192 21.9		30.3	111 21.0		21.7	356 23.5 128 2 27.8 +130
	23	352 55.6	159 52.0		22.1	180 26.0		25.2	207 23.9		30.2	126 23.2		21.8	10 55.3 127 2 14.8 +131
30	0	7 58.1	174 51.7	- 4 23.3	195 27.0	+ 4 24.5	222 25.9	+14 30.0	141 25.4	-15 21.9	25 27.0	127	-2 01.7	+130	
	1	23 00.5	189 51.3		24.6	210 28.0		23.9	237 27.9		29.9	156 27.6		21.9	39 58.7 127 1 48.7 +131
	2	38 03.0	204 50.9		25.8	225 29.0		23.3	252 29.9		29.8	171 29.8		22.0	54 30.4 126 1 35.6 +132
	3	53 05.5	219 50.5	..	27.1	240 30.0	..	22.6	267 31.9	..	29.6	186 32.1	..	22.1	69 02.0 127 -1 22.4 +131
	4	68 07.9	234 50.1		28.4	255 31.0		22.0	282 33.9		29.5	201 34.3		22.2	83 33.7 126 1 09.3 +132
	5	83 10.4	249 49.7		29.6	270 32.0		21.4	297 35.9		29.3	216 36.5		22.2	98 05.3 125 0 56.1 +131
	6	98 12.9	264 49.3	- 4 30.9	285 33.0	+ 4 20.7	312 37.9	+14 29.2	231 38.7	-15 22.3	112 36.8	126	-0 43.0	+132	
	7	113 15.3	279 48.9		32.2	300 34.0		20.1	327 39.9		29.0	246 40.9		22.4	127 08.4 125 0 29.8 +132
	8	128 17.8	294 48.5		33.4	315 35.0		19.5	342 41.9		28.9	261 43.2		22.5	141 39.9 125 0 16.6 +133
	9	143 20.3	309 48.1	..	34.7	330 36.0	..	18.8	357 43.9	..	28.7	276 45.4	..	22.5	156 11.4 124 -0 03.3 +132
	10	158 22.7	324 47.7		35.9	345 37.0		18.2	12 45.9		28.6	291 47.6		22.6	170 42.8 124 + 0 09.9 +133
	11	173 25.2	339 47.3		37.2	0 38.0		17.5	27 48.0		28.4	306 49.8		22.7	185 14.2 124 0 23.2 +132
	12	188 27.6	354 46.9	- 4 38.5	15 39.0	+ 4 16.9	42 50.0	+14 28.3	321 52.0	-15 22.8	199 45.6	123	+ 0 36.4	+133	
	13	203 30.1	9 46.6		39.7	30 40.0		16.3	57 52.0		28.1	336 54.3		22.8	214 16.9 123 0 49.7 +133
	14	218 32.6	24 46.2		41.0	45 41.0		15.6	72 54.0		28.0	351 56.5		22.9	228 48.2 123 1 03.0 +133
	15	233 35.0	39 45.8	..	42.2	60 42.0	..	15.0	8						

G M T	SUN		STARS				Lat.	Sunrise	Twit. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.	No.	Name	SHA	Dec.				28	29	30	1	Sun's Lower Limb Add	Venus Add	Mars Add			
	h °	°	°	°	°	°	h m	h m	h m	h m	h m	h m							
28	0	182 14.4	- 1 37.7	7	Acamar	315 50.8	-40 28.6	72	6 06	1 36	17 12	16 51	16 32	16 11	Alt.				
	1	197 14.6	38.7	5	Achernar	335 58.3	-57 27.4	70	6 04	2 13	16 59	16 46	16 34	16 21					
	2	212 14.8	39.7	30	Acrux	173 58.5	-62 51.3	68	6 03	2 38	16 49	16 42	16 35	16 28					
	3	227 15.0	40.6	19	Adhara	255 46.6	-28 54.4	66	6 02	2 57	16 40	16 38	16 36	16 35					
	4	242 15.2	41.6	10	Aldebaran	291 38.9	+16 25.4	64	6 01	3 12	16 33	16 35	16 38	16 40	0				
	5	257 15.4	42.6					62	6 00	3 24	16 27	16 33	16 39	16 45	30	0.3	0.1	0.1	
	6	272 15.6	- 1 43.6	32	Alioth	166 59.1	+56 12.0	60	5 59	3 33	16 21	16 31	16 40	16 50	45	0.3	0.1	0.0	
	7	287 15.8	44.5	34	Alkaid	153 33.3	+49 32.1	58	5 58	3 42	16 16	16 29	16 41	16 53	60	0.3	0.0	0.0	
	8	302 16.1	45.5	55	Al Na'ir	28 37.5	-47 10.5	56	5 57	3 49	16 12	16 27	16 41	16 57	75	0.3	0.0	0.0	
	9	317 16.3	46.5	15	Alnilam	276 30.2	- 1 13.6	54	5 57	3 56	16 08	16 25	16 42	17 00	90				
	10	332 16.5	47.5	25	Alphard	218 38.8	- 8 27.9	52	5 56	4 01	16 05	16 24	16 42	17 02					
	11	347 16.7	48.4					50	5 56	4 05	16 01	16 22	16 43	17 05					
	12	2 16.9	- 1 49.4	41	Alphecca	126 47.9	+26 51.9	45	5 54	4 15	15 54	16 19	16 44	17 10	Moon's Lower Limb				
	13	17 17.1	50.4	1	Alpheratz	358 28.0	+28 51.0	40	5 53	4 23	15 48	16 17	16 45	17 15	Add				
	14	32 17.3	51.3	51	Altair	62 50.3	+ 8 45.3	35	5 53	4 28	15 43	16 15	16 46	17 19	Alt.	28	29	30	
	15	47 17.5	52.3	2	Ankaa	353 57.8	-42 32.6	30	5 52	4 32	15 39	16 13	16 47	17 23	0				
	16	62 17.7	53.3	42	Antares	113 19.5	-26 20.2	20	5 50	4 37	15 31	16 10	16 48	17 29	4	14.7	15.6	16.4	
	17	77 17.9	54.3					10	5 49	4 39	15 24	16 07	16 50	17 34	8	14.7	15.6	16.4	
	18	92 18.2	- 1 55.2	37	Arcturus	146 35.5	+19 24.8	0	5 47	4 39	15 18	16 04	16 51	17 40	12	14.7	15.6	16.4	
	19	107 18.4	56.2	43	Atria	109 00.4	-68 57.2	10	5 46	4 36	15 11	16 01	16 52	17 45	16	14.7	15.6	16.4	
	20	122 18.6	57.2	22	Avior	234 36.1	-59 21.8	20	5 44	4 31	15 04	15 58	16 53	17 50	20	14.7	15.6	16.4	
	21	137 18.8	58.2	13	Bellatrix	279 18.3	+ 6 18.8	30	5 42	4 23	14 56	15 55	16 55	17 57	24	14.7	15.6	16.4	
	22	152 19.0	1 59.1	16	Betelge'se	271 48.1	+ 7 24.1	35	5 41	4 17	14 52	15 53	16 56	18 01	28	14.7	15.6	16.4	
	23	167 19.2	2 00.1					40	5 39	4 09	14 46	15 51	16 57	18 05	32	14.8	15.6	16.3	
				17	Canopus	264 15.4	-52 39.9	45	5 37	3 59	14 40	15 48	16 58	18 10	36	14.8	15.6	16.3	
				12	Capella	281 38.3	+45 57.2	50	5 35	3 46	14 33	15 45	17 00	18 16	40	14.8	15.6	16.3	
				53	Deneb	50 00.7	+45 07.7	52	5 34	3 40	14 30	15 44	17 00	18 19	44	14.9	15.6	16.2	
				28	Denebola	183 18.0	+14 49.2	54	5 33	3 32	14 26	15 43	17 01	18 22	48	14.9	15.6	16.2	
				4	Diphda	349 38.9	-18 13.5	56	5 32	3 24	14 22	15 41	17 02	18 25	52	14.9	15.6	16.2	
								58	5 31	3 13	14 17	15 39	17 03	18 29	56	15.0	15.6	16.2	
								60	5 29	3 01	14 12	15 37	17 04	18 34	60	15.0	15.6	16.1	
								S							64	15.1	15.6	16.0	
								Lat.	Sunset	Twit. ends	Moonset								
								N	h	m	h	m	h	m	h	m			
								72	17 32	21 53	0 09	2 12	4 11	6 12	72	15.2	15.6	15.9	
								70	17 35	21 20	0 31	2 22	4 12	6 06	80	15.2	15.6	15.9	
								68	17 36	20 55	0 47	2 30	4 14	6 00	84	15.3	15.6	15.8	
								66	17 38	20 38	1 00	2 37	4 15	5 56	88	15.3	15.6	15.8	
								64	17 39	20 24	1 11	2 43	4 16	5 52	90	15.3	15.6	15.8	
								62	17 40	20 12	1 21	2 48	4 17	5 49	Add to table, back cover				
								60	17 41	20 03	1 28	2 52	4 18	5 46	Moon's Upper Limb				
								58	17 42	19 55	1 35	2 56	4 18	5 43	Subtract				
								56	17 43	19 49	1 41	2 59	4 19	5 41	Alt.	28	29	30	
								54	17 43	19 42	1 47	3 02	4 19	5 39	0				
								52	17 44	19 37	1 52	3 05	4 20	5 37	4	16.1	15.6	15.0	
								50	17 45	19 33	1 56	3 07	4 20	5 36	8	16.1	15.6	15.0	
								45	17 46	19 24	2 06	3 13	4 21	5 32	12	16.0	15.6	15.1	
								40	17 47	19 17	2 14	3 17	4 22	5 29	16	16.0	15.6	15.1	
								35	17 48	19 12	2 20	3 21	4 23	5 27	20	16.0	15.6	15.1	
								30	17 49	19 08	2 26	3 24	4 23	5 24	24	16.0	15.6	15.1	
								20	17 51	19 04	2 37	3 30	4 24	5 20	28	16.0	15.6	15.1	
								10	17 52	19 02	2 45	3 35	4 25	5 17	32	16.0	15.6	15.1	
								0	17 54	19 03	2 54	3 40	4 26	5 14	36	16.0	15.6	15.1	
								10	17 56	19 06	3 02	3 44	4 27	5 11	40	15.9	15.6	15.2	
								20	17 58	19 12	3 11	3 49	4 28	5 07	44	15.9	15.6	15.2	
								30	18 00	19 20	3 20	3 55	4 29	5 03	48	15.9	15.6	15.2	
								35	18 01	19 26	3 26	3 58	4 29	5 01	52	15.8	15.6	15.3	
								40	18 03	19 35	3 33	4 01	4 30	4 58	56	15.8	15.6	15.3	
								45	18 05	19 45	3 40	4 05	4 30	4 55	60	15.8	15.6	15.3	
								50	18 07	19 59	3 49	4 10	4 31	4 52	64	15.7	15.6	15.4	
								52	18 08	20 06	3 53	4 13	4 31	4 50	68	15.7	15.6	15.4	
								54	18 09	20 13	3 57	4 15	4 32	4 49	72	15.6	15.6	15.5	
								56	18 10	20 22	4 02	4 18	4 32	4 47	76	15.6	15.6	15.5	
								58	18 12	20 33	4 08	4 21	4 32	4 44	80	15.5	15.6	15.6	
								60	18 14	20 46	4 14	4 24	4 33	4 42	84	15.5	15.6	15.6	
								S							88	15.4	15.6	15.7	
															90	15.4	15.6	15.7	
								G	Equation of Time (App. Mean)			GMT of Transit Meridian of Greenwich							
								M	28	29	30	DAY	Moon	Venus	Mars	Jupiter	Saturn		
								h	m	s	m	s	h	m	h	m	h	m	
								0	+ 8 57.0	+ 9 17.3	+ 9 37.3	28	21 29	12 20	11 01	9 15	14 39		
								6	+ 9 02.1	+ 9 22.3	+ 9 42.3	29	22 15	12 20	10 59	9 12	14 36		
								12	+ 9 07.2	+ 9 27.3	+ 9 47.2	30	23 02	12 21	10 58	9 09	14 32		
								18	+ 9 12.2	+ 9 32.3	+ 9 52.1	1	23 51	12 22	10 56	9 06	14 29		
								24	+ 9										

G M T	VENUS - 3.4		MARS 2.0		JUPITER - 1.4		SATURN 0.8		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
1 0	8 57.2	174 42.2	- 4 53.6	195 51.0	+ 4 09.3	223 14.1	+14 26.5	142 18.7	-15 23.6	13 59.0	119 +	3 16.1 +134
1 1	23 59.7	189 41.8	54.8	210 52.0	08.6	238 16.1	26.4	157 20.9	23.7	28 29.9	118	3 29.5 +133
2 2	39 02.1	204 41.4	56.1	225 53.0	08.0	253 18.1	26.2	172 23.1	23.8	43 00.7	117	3 42.8 +133
3 3	54 04.6	219 41.0	57.3	240 54.0	07.4	268 20.1	26.1	187 25.3	23.9	57 31.4	117	3 56.1 +133
4 4	69 07.1	234 40.6	58.6	255 54.9	06.7	283 22.1	25.9	202 27.6	23.9	72 02.1	117	4 09.4 +132
5 5	84 09.5	249 40.2	4 59.8	270 55.9	06.1	298 24.1	25.8	217 29.8	24.0	86 32.8	116	4 22.6 +133
6 6	99 12.0	264 39.8	- 5 01.1	285 56.9	+ 4 05.5	313 26.1	+14 25.6	232 32.0	-15 24.1	101 03.4	115 +	4 35.9 +133
7 7	114 14.5	279 39.4	02.4	300 57.9	04.8	328 28.1	25.5	247 34.2	24.2	115 33.9	115	4 49.2 +132
8 8	129 16.9	294 39.0	03.6	315 58.9	04.2	343 30.1	25.4	262 36.4	24.2	130 04.4	115	5 02.4 +133
9 9	144 19.4	309 38.6	04.9	330 59.9	03.6	358 32.2	25.2	277 38.7	24.3	144 34.9	113	5 15.7 +132
10 10	159 21.9	324 38.3	06.1	346 00.9	02.9	13 34.2	25.1	292 40.9	24.4	159 05.2	114	5 28.9 +132
11 11	174 24.3	339 37.9	07.4	1 01.9	02.3	28 36.2	24.9	307 43.1	24.5	173 35.6	113	5 42.1 +132
12 12	189 26.8	354 37.5	- 5 08.6	16 02.9	+ 4 01.6	43 38.2	+14 24.8	322 45.3	-15 24.5	188 05.9	112 +	5 55.3 +132
13 13	204 29.2	9 37.1	09.9	31 03.9	01.0	58 40.2	24.6	337 47.5	24.6	202 36.1	112	6 08.5 +131
14 14	219 31.7	24 36.7	11.1	46 04.9	4 00.4	73 42.2	24.5	352 49.7	24.7	217 06.3	111	6 21.6 +131
15 15	234 34.2	39 36.3	12.4	61 05.9	3 59.7	88 44.2	24.3	7 52.0	24.8	231 36.4	111	6 34.7 +131
16 16	249 36.6	54 35.9	13.7	76 06.9	59.1	103 46.2	24.2	22 54.2	24.8	246 06.5	110	6 47.8 +131
17 17	264 39.1	69 35.5	14.9	91 07.9	58.5	118 48.3	24.0	37 56.4	24.9	260 36.5	109	7 00.9 +131
18 18	279 41.6	84 35.1	- 5 16.2	106 08.9	+ 3 57.8	133 50.3	+14 23.9	52 58.6	-15 25.0	275 06.4	109 +	7 14.0 +130
19 19	294 44.0	99 34.7	17.4	121 09.9	57.2	148 52.3	23.7	68 00.8	25.1	289 36.3	108	7 27.0 +130
20 20	309 46.5	114 34.3	18.7	136 10.9	56.5	163 54.3	23.6	83 03.0	25.1	304 06.1	108	7 40.0 +130
21 21	324 49.0	129 33.9	19.9	151 11.9	55.9	178 56.3	23.5	98 05.3	25.2	318 35.9	107	7 53.0 +129
22 22	339 51.4	144 33.5	21.2	166 12.9	55.3	193 58.3	23.3	113 07.5	25.3	333 05.6	107	8 05.9 +129
23 23	354 53.9	159 33.1	22.4	181 13.9	54.6	209 00.3	23.2	128 09.7	25.3	347 35.3	105	8 18.8 +128
2 0	9 56.4	174 32.7	- 5 23.7	196 14.9	+ 3 54.0	224 02.3	+14 23.0	143 11.9	-15 25.4	2 04.8	106 +	8 31.6 +129
1 1	24 58.8	189 32.3	24.9	211 15.9	53.4	239 04.4	22.9	158 14.1	25.5	16 34.4	104	8 44.5 +128
2 2	40 01.3	204 31.9	26.2	226 16.9	52.7	254 06.4	22.7	173 16.4	25.6	31 03.8	104	8 57.3 +127
3 3	55 03.7	219 31.5	27.5	241 17.9	52.1	269 08.4	22.6	188 18.6	25.6	45 33.2	103	9 10.0 +127
4 4	70 06.2	234 31.1	28.7	256 18.9	51.5	284 10.4	22.4	203 20.8	25.7	60 02.5	103	9 22.7 +127
5 5	85 08.7	249 30.7	30.0	271 19.9	50.8	299 12.4	22.3	218 23.0	25.8	74 31.8	102	9 35.4 +126
6 6	100 11.1	264 30.3	- 5 31.2	286 20.9	+ 3 50.2	314 14.4	+14 22.1	233 25.2	-15 25.9	89 01.0	101 +	9 48.0 +126
7 7	115 13.6	279 29.9	32.5	301 21.9	49.5	329 16.4	22.0	248 27.4	25.9	103 30.1	101	10 00.6 +125
8 8	130 16.1	294 29.5	33.7	316 22.9	48.9	344 18.4	21.9	263 29.7	26.0	117 59.2	100	10 13.1 +125
9 9	145 18.5	309 29.1	35.0	331 23.9	48.3	359 20.5	21.7	278 31.9	26.1	132 58.2	99	10 25.6 +124
10 10	160 21.0	324 28.7	36.2	346 24.9	47.6	14 22.5	21.6	293 34.1	26.2	146 57.1	98	10 38.0 +124
11 11	175 23.5	339 28.3	37.5	1 25.9	47.0	29 24.5	21.4	308 36.3	26.2	161 25.9	98	10 50.4 +123
12 12	190 25.9	354 27.9	- 5 38.7	16 26.9	+ 3 46.3	44 26.5	+14 21.3	323 38.5	-15 26.3	175 54.7	97	+11 02.7 +123
13 13	205 28.4	9 27.5	40.0	31 27.9	45.7	59 28.5	21.1	338 40.7	26.4	190 23.4	97	11 15.0 +122
14 14	220 30.8	24 27.1	41.2	46 28.9	45.1	74 30.5	21.0	353 42.9	26.5	204 52.1	96	11 27.2 +122
15 15	235 33.3	39 26.7	42.5	61 29.9	44.4	89 32.5	20.8	8 45.2	26.5	219 20.7	95	11 39.4 +121
16 16	250 35.8	54 26.2	43.7	76 30.9	43.8	104 34.6	20.7	23 47.4	26.6	233 49.2	94	11 51.5 +120
17 17	265 38.2	69 25.8	45.0	91 31.9	43.2	119 36.6	20.5	38 49.6	26.7	248 17.6	93	12 03.5 +120
18 18	280 40.7	84 25.4	- 5 46.2	106 32.8	+ 3 42.5	134 38.6	+14 20.4	53 51.8	-15 26.8	262 45.9	93	+12 15.5 +119
19 19	295 43.2	99 25.0	47.5	121 33.8	41.9	149 40.6	20.3	68 54.0	26.8	277 14.2	92	12 27.4 +119
20 20	310 45.6	114 24.6	48.7	136 34.8	41.2	164 42.6	20.1	83 56.2	26.9	291 42.4	92	12 39.3 +118
21 21	325 48.1	129 24.2	50.0	151 35.8	40.6	179 44.6	20.0	98 58.5	27.0	306 10.6	90	12 51.1 +117
22 22	340 50.6	144 23.8	51.2	166 36.8	40.0	194 46.7	19.8	114 00.7	27.1	320 38.6	90	13 02.8 +116
23 23	355 53.0	159 23.4	52.5	181 37.8	39.3	209 48.7	19.7	129 02.9	27.1	335 06.6	90	13 14.4 +116
3 0	10 55.5	174 23.0	- 5 53.7	196 38.8	+ 3 38.7	224 50.7	+14 19.5	144 05.1	-15 27.2	349 34.6	88	+13 26.0 +115
1 1	25 58.0	189 22.6	55.0	211 39.8	38.1	239 52.7	19.4	159 07.3	27.3	4 02.4	88	13 37.5 +115
2 2	41 00.4	204 22.2	56.2	226 40.8	37.4	254 54.7	19.2	174 09.5	27.4	18 30.2	87	13 49.0 +113
3 3	56 02.9	219 21.8	57.5	241 41.8	36.8	269 56.7	19.1	189 11.7	27.4	32 57.9	86	14 00.3 +113
4 4	71 05.3	234 21.4	58.7	256 42.8	36.1	284 58.8	19.0	204 14.0	27.5	47 25.5	85	14 11.6 +112
5 5	86 07.8	249 21.0	6 00.0	271 43.8	35.5	300 00.8	18.8	219 16.2	27.6	61 53.0	85	14 22.8 +111
6 6	101 10.3	264 20.6	- 6 01.2	286 44.8	+ 3 34.9	315 02.8	+14 18.7	234 18.4	-15 27.7	76 20.5	84	+14 33.9 +110
7 7	116 12.7	279 20.2	02.5	301 45.8	34.2	330 04.8	18.5	249 20.6	27.7	90 47.9	83	14 44.9 +110
8 8	131 15.2	294 19.8	03.7	316 46.8	33.6	345 06.8	18.4	264 22.8	27.8	105 15.2	82	14 55.9 +109
9 9	146 17.7	309 19.4	05.0	331 47.8	33.0	0 08.8	18.2	279 25.0	27.9	119 42.4	82	15 06.8 +107
10 10	161 20.1	324 19.0	06.2	346 48.8	32.3	15 10.9	18.1	294 27.2	28.0	134 09.6	81	15 17.5 +107
11 11	176 22.6	339 18.6	07.4	1 49.8	31.7	30 12.9	17.9	309 29.5	28.0	148 36.7	80	15 28.2 +106
12 12	191 25.1	354 18.1	- 6 08.7	16 50.8	+ 3 31.0	45 14.9	+14 17.8	324 31.7	-15 28.1	163 03.7	79	+15 38.8 +105
13 13	206 27.5	9 17.7	09.9	31 51.8	30.4	60 16.9	17.7	339 33.9	28.2	177 30.6	79	15 49.3 +105
14 14	221 30.0	24 17.3	11.2	46 52.8	29.8	75 18.9	17.5	354 36.1	28.3	191 57.5	78	15 59.8 +103
15 15	236 32.4	39 16.9	12.4	61 53.8	29.1	90 21.0	17.4	9 38.3	28.3	206 24.3	77	16 10.1 +102
16 16	251 34.9	54 16.5	13.7	76 54.8	28.5	105 23.0	17.2	24 40.5	28.4	220 51.0	76	16 20.3 +101
17 17	266 37.4	69 16.1	14.9	91 55.8	27.8	120 25.0	17.1	39 42.7	28.5	235 17.6	76	16 30.4 +101
18 18	281 39.8	84 15.7	- 6 16.2	106 56.8	+ 3 27.2	135 27.0	+14 16.9	54 45.0	-15 28.6	249 44.2	75	+16 40.5 + 99
19 19	296 42.3	99 15.3	17.4	121 57.8	26.6	150 29.0	16.8	69 47.2	28.6	264 10.7	74	16 50.4 + 98
20 20	311 44.8	114 14.9	18.7	136 58.8	25.9	165 31.0	16.6	84 49.4	28.7	278 37.1	73	17 00.2 + 98
21 21	326 47.2	129 14.5	19.9	151 59.8	25.3	180 33.1	16.5	99 51.6	28.8	293 03.4	73	17 10.0 + 96
22 22	341 49.7	144 14.1	21.1	167 00.8	24.6	195 35.1	16.4	114 53.8	28.9	307 29.7	71	17 19.6 + 95
23 23	356 52.2	159 13.7	22.4	182 01.8	24.0	210 37.1	16.2	129 56.0	28.9	321 55.8	72	17 29.1 + 94
24	11 54.6	174 13.2	- 6 23.6	197 02.8	+ 3 23.4	225 39.1	+14 16.1	144 58.2	-15 29.0	336 22.0	70	+17 38.5 + 93
code	-	- 4	- 13	+ 10	- 6	+ 20	- 2	+ 22	- 1			

G M T	SUN		STARS		Lat.	Sunrise	Twit. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS						
	GHA	Dec.	No.	Name SHA Dec.				1	2	3	4	Alt.	Sun's Low'r Limb	Venus	Mars			
1	182 29.4	- 2 47.7	7	Acamar	315 50.7	-40 28.6	72	6 20	2 03	16 11	15 47	15 06	14 56					
0	197 29.6	48.7	5	Achernar	335 58.2	-57 27.4	70	6 17	2 12	16 21	16 06	15 45	15 06	Alt.	Sun's Low'r Limb	Venus	Mars	
2	212 29.8	49.7	30	Acrux	173 58.5	-62 51.3	68	6 14	2 54	16 28	16 21	16 13	16 01	Add	Add	Add	Add	
3	227 30.0	50.7	19	Adhara	255 46.5	-28 54.4	66	6 11	3 10	16 35	16 34	16 34	16 37	0	0	0	0	
4	242 30.2	51.6	10	Aldebaran	291 38.9	+16 25.4	64	6 09	3 23	16 40	16 45	16 51	17 03	30	0.3	0.1	0.1	
5	257 30.4	52.6					62	6 08	3 34	16 45	16 54	17 05	17 23	45	0.3	0.1	0.0	
6	272 30.6	- 2 53.6	32	Alioth	166 59.1	+56 12.0	60	6 06	3 43	16 50	17 01	17 17	17 40	60	0.3	0.1	0.0	
7	287 30.8	54.5	34	Alkaid	153 33.3	+49 32.1	58	6 05	3 49	16 53	17 08	17 27	17 54	75	0.3	0.0	0.0	
8	302 31.0	55.5	55	Al Na'ir	28 37.5	-47 10.5	56	6 03	3 56	16 57	17 14	17 37	18 06	90	0.3	0.0	0.0	
9	317 31.2	56.5	15	Alnilam	276 30.2	- 1 13.6	54	6 02	4 01	17 00	17 20	17 45	18 17					
10	332 31.4	57.5	25	Alphard	218 38.8	- 8 27.9	52	6 01	4 07	17 02	17 25	17 52	18 26					
11	347 31.6	58.4					50	6 00	4 11	17 05	17 29	17 58	18 35					
12	2 31.8	- 2 59.4	41	Alphecca	126 47.9	+26 51.9	45	5 58	4 19	17 10	17 39	18 13	18 53	Moon's Lower Limb				
13	17 32.0	3 00.4	1	Alpheratz	358 28.0	+28 51.0	40	5 56	4 25	17 15	17 48	18 24	19 07	Add				
14	32 32.2	01.3	51	Altair	62 50.3	+ 8 45.3	35	5 55	4 30	17 19	17 55	18 34	19 20	Alt.	1	2	3	
15	47 32.4	02.3	2	Ankaa	353 57.8	-42 32.6	30	5 53	4 34	17 23	18 01	18 43	19 31	0	17.3	18.1	18.6	
16	62 32.6	03.3	42	Antares	113 19.5	-26 20.2	20	5 51	4 38	17 29	18 12	18 59	19 50	4	17.3	18.1	18.6	
17	77 32.8	04.2					10	5 49	4 39	17 34	18 22	19 12	20 07	8	17.3	18.1	18.6	
18	92 33.0	- 3 05.2	37	Arcturus	146 35.5	+19 24.8	0	5 46	4 38	17 40	18 31	19 25	20 22	12	17.3	18.1	18.6	
19	107 33.2	06.2	43	Atria	109 00.5	-68 57.2	10	5 44	4 34	17 45	18 40	19 38	20 38	16	17.3	18.0	18.5	
20	122 33.4	07.2	22	Avior	234 36.1	-59 21.8	20	5 41	4 28	17 50	18 50	19 52	20 55	20	17.3	18.0	18.5	
21	137 33.6	08.1	13	Bellatrix	279 18.3	+ 6 18.8	30	5 38	4 18	17 57	19 01	20 07	21 14	24	17.2	17.9	18.4	
22	152 33.8	09.1	16	Betelge'se	271 48.0	+ 7 24.1	35	5 36	4 12	18 01	19 08	20 17	21 26	28	17.2	17.9	18.4	
23	167 34.0	10.1					40	5 34	4 04	18 05	19 15	20 27	21 39	32	17.1	17.8	18.3	
2	182 34.3	- 3 11.0	17	Canopus	264 15.3	-52 39.9	45	5 32	3 53	18 10	19 24	20 40	21 55	36	17.1	17.8	18.2	
1	197 34.5	12.0	12	Capella	281 38.2	+45 57.2	50	5 29	3 38	18 16	19 35	20 55	22 14	40	17.0	17.7	18.1	
0	212 34.7	13.0	53	Deneb	50 00.8	+45 07.7	52	5 27	3 32	18 19	19 40	21 02	22 23	44	17.0	17.6	18.0	
3	227 34.9	13.9	28	Denebola	183 18.0	+14 49.2	54	5 26	3 23	18 22	19 46	21 10	22 33	48	16.9	17.5	17.9	
4	242 35.1	14.9	4	Diphda	349 38.9	-18 13.5	56	5 24	3 14	18 25	19 52	21 19	22 45	52	16.8	17.4	17.7	
5	257 35.3	15.9					58	5 22	3 02	18 29	19 59	21 30	22 58	56	16.8	17.3	17.6	
6	272 35.5	- 3 16.9	27	Dubhe	194 45.1	+61 59.3	50	5 20	2 49	18 34	20 07	21 41	23 14	60	16.7	17.2	17.5	
7	287 35.7	17.8	14	Elnath	279 07.2	+28 34.3	S							64	16.6	17.0	17.3	
8	302 35.9	18.8	47	Eltanin	91 06.3	+51 29.9		Lat.	Sunset	Twit. ends	Moonset				68	16.5	16.9	17.2
9	317 36.1	19.8	54	Enif	34 29.3	+ 9 40.5					1	2	3	4	72	16.4	16.8	17.0
10	332 36.3	20.7	56	Fomalhaut	16 11.3	-29 51.3	N.				h m	h m	h m	h m	76	16.3	16.6	16.9
11	347 36.5	21.7	31	Gacrux	172 49.8	-56 52.0	72	17 17	21 26	6 12	8 23	10 55	13 04	80	16.2	16.5	16.7	
12	2 36.7	- 3 22.7	29	Gienah	176 37.2	-17 17.8	70	17 21	20 59	6 06	8 05	10 17	13 04	84	16.1	16.4	16.5	
13	17 36.9	23.6	35	Hadar	149 50.0	-60 09.7	68	17 24	20 39	6 00	7 52	9 51	12 01	88	16.0	16.2	16.4	
14	32 37.1	24.6	6	Hamal	328 49.3	+23 15.4	66	17 26	20 23	5 56	7 41	9 31	11 26	90	16.0	16.1	16.2	
15	47 37.3	25.6	48	Kaus Aust.	84 41.2	-34 24.5	64	17 28	20 11	5 52	7 32	9 15	11 00		Add to table, back cover			
16	62 37.5	26.6					62	17 30	20 01	5 49	7 24	9 02	10 41		Moon's Upper Limb			
17	77 37.7	27.5	40	Kochab	137 18.9	+74 20.3	60	17 32	19 53	5 46	7 17	8 51	10 25		Subtract			
18	92 37.9	- 3 28.5	57	Markab	14 21.1	+14 58.3	58	17 33	19 45	5 43	7 11	8 41	10 11	Alt.	1	2	3	
19	107 38.1	29.5	8	Menkar	315 00.0	+ 3 55.2	56	17 35	19 40	5 41	7 06	8 33	10 00	0	14.5	14.1	13.8	
20	122 38.3	30.4	36	Menkent	148 59.0	-36 09.2	54	17 36	19 35	5 39	7 01	8 25	9 50	4	14.5	14.1	13.8	
21	137 38.5	31.4	24	Miapl'dus	221 49.6	-69 31.9	52	17 37	19 30	5 37	6 57	8 19	9 40	12	14.6	14.2	13.9	
22	152 38.7	32.4					50	17 38	19 26	5 36	6 53	8 13	9 32	16	14.6	14.2	14.0	
23	167 38.9	33.3	9	Mirfak	309 42.0	+49 42.3	45	17 40	19 18	5 32	6 45	8 00	9 15	20	14.7	14.3	14.0	
3	182 39.1	- 3 34.3	50	Nunki	76 51.8	-26 21.2	40	17 42	19 12	5 29	6 38	7 49	9 01	24	14.7	14.4	14.1	
1	197 39.3	35.3	52	Peacock	54 27.0	-56 52.8	35	17 44	19 08	5 27	6 32	7 40	8 50	32	14.8	14.4	14.2	
2	212 39.5	36.2	21	Pollux	244 20.6	+28 08.0	30	17 45	19 04	5 24	6 27	7 32	8 39	36	14.8	14.5	14.3	
3	227 39.7	37.2	20	Procyon	245 45.0	+ 5 20.4	20	17 48	19 01	5 20	6 18	7 19	8 22	40	14.9	14.6	14.4	
4	242 39.9	38.2					10	17 50	19 00	5 17	6 11	7 07	8 06	44	15.0	14.7	14.5	
5	242 39.9	38.2	46	R'alhague	96 46.7	+12 35.6	0	17 53	19 02	5 14	6 03	6 56	7 52	48	15.0	14.8	14.7	
6	257 40.1	39.1	26	Regulus	208 29.7	+12 11.0	10	17 55	19 05	5 11	5 56	6 45	7 38	52	15.1	14.9	14.8	
7	272 40.3	- 3 40.1	11	Rigel	281 53.5	- 8 14.9	20	17 58	19 12	5 07	5 49	6 33	7 22	56	15.2	15.0	14.9	
8	287 40.4	41.1	38	Rigel Kent.	140 51.5	-60 39.4	30	18 02	19 23	5 03	5 40	6 20	7 05	60	15.3	15.2	15.1	
9	302 40.6	42.0	44	Sabik	103 02.3	-15 40.3	35	18 04	19 30	5 01	5 35	6 12	6 55	64	15.4	15.3	15.2	
10	317 40.8	43.0					40	18 06	19 38	4 58	5 29	6 04	6 43	68	15.5	15.4	15.4	
11	332 41.0	44.0	3	Schedar	350 29.4	+56 17.9	45	18 08	19 49	4 55	5 23	5 53	6 30	72	15.5	15.5	15.5	
12	347 41.2	44.9	45	Shaula	97 20.8	-37 04.5	50	18 12	20 05	4 52	5 15	5 41	6 13	76	15.6	15.7	15.7	
13	2 41.4	- 3 45.9	18	Sirius	259 11.8	-16 39.1	52	18 13	20 12	4 50	5 11	5 35	6 05	80	15.7	15.8	15.9	
14	17 41.6	46.9	33	Spica	159 17.2	-10 55.8	54	18 15	20 21	4 49	5 07	5 29	5 57	84	15.8	16.0	16.0	
15	32 41.8	47.9	23	Suhail	223 24.6	-43 15.0	56	18 16	20 30	4 47	5 03	5 22	5 47	88	15.9	16.1	16.2	
16	47 42.0	48.8					58	18 18	20 42	4 44	4 58	5 14	5 36	90				
17	62 42.2	49.8	49	Vega	81 08.3	+38 44.8	60	18 21	20 56	4 42	4 53	5 06	5 24		Subtract from table, back cover			
18	77 42.4	50.8	39	Zub'g'bi	137 53.6	-15 51.5	S								First Day of Feast of Tabernacles (Succoth)			
19	92 42.6	- 3 51.7	G M T	Equation of Time (App. - Mean)			GMT of Transit Meridian of Greenwich							Full Moon				
20	107 42.8	52.7	1	2	3	DAY	Moon	Venus	Mars	Jupiter	Saturn							
21	122 43.0	53.7	h	m s	m s	m s	h m	h m	h m	h m	h m							
22	137 43.2	54.6	0	+ 9 57.1	+10 16.6	+10 35.8	1	23 51	12 22	10 56	9 06	14 29						
23	152 43.4	55.6	6	+10 02.0	+10 21.4	+10 40.6	2	24 43	12 22	10 54	9 03	14 25						
24	167 43.6	56.6	12	+10 06.9	+10 26.3	+10 45.3	3	0 43	12 23	10 53	8 59	14 22						
			18	+10 11.7	+10 31.1	+10 50.1	4	1 38	12 24	10 51	8 56	14 18						
			24	+10 16.6	+10 35.8	+10 54.8												
code	-	- 9																

G M T	VENUS - 3.4		MARS 2.0		JUPITER - 1.4		SATURN 0.8		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
4 0	11 54.6	174 13.2	- 6 23.6	197 02.8	+ 3 23.4	225 39.1	+14 16.1	144 58.2	-15 29.0	336 22.0	70	+17 38.5 + 93
1	26 57.1	189 12.8	24.9	212 03.8	22.7	240 41.1	15.9	160 00.4	29.1	350 48.0	70	17 47.8 + 92
2	41 59.6	204 12.4	26.1	227 04.8	22.1	255 43.2	15.8	175 02.7	29.2	5 14.0	68	17 57.0 + 91
3	57 02.0	219 12.0	27.4	242 05.8	21.5	270 45.2	15.6	190 04.9	29.2	19 39.8	69	18 06.1 + 89
4	72 04.5	234 11.6	28.6	257 06.8	20.8	285 47.2	15.5	205 07.1	29.3	34 05.7	67	18 15.0 + 89
5	87 06.9	249 11.2	29.8	272 07.8	20.2	300 49.2	15.3	220 09.3	29.4	48 31.4	67	18 23.9 + 87
6	102 09.4	264 10.8	- 6 31.1	287 08.8	+ 3 19.5	315 51.2	+14 15.2	235 11.5	-15 29.5	62 57.1	66	+18 32.6 + 86
7	117 11.9	279 10.4	32.3	302 09.8	18.9	330 53.3	15.1	250 13.7	29.5	77 22.7	65	18 41.2 + 85
8	132 14.3	294 10.0	33.6	317 10.8	18.3	345 55.3	14.9	265 15.9	29.6	91 48.2	65	18 49.7 + 84
9	147 16.8	309 09.5	34.8	332 11.8	17.6	0 57.3	14.8	280 18.1	29.7	106 13.7	64	18 58.1 + 83
10	162 19.3	324 09.1	36.1	347 12.8	17.0	15 59.3	14.6	295 20.4	29.8	120 39.1	64	19 06.4 + 81
11	177 21.7	339 08.7	37.3	2 13.8	16.3	31 01.4	14.5	310 22.6	29.8	135 04.5	62	19 14.5 + 80
12	192 24.2	354 08.3	- 6 38.5	17 14.8	+ 3 15.7	46 03.4	+14 14.3	325 24.8	-15 29.9	149 29.7	62	+19 22.5 + 79
13	207 26.7	9 07.9	39.8	32 15.8	15.1	61 05.4	14.2	340 27.0	30.0	163 54.9	62	19 30.4 + 77
14	222 29.1	24 07.5	41.0	47 16.8	14.4	76 07.4	14.1	355 29.2	30.1	178 20.1	60	19 38.1 + 77
15	237 31.6	39 07.1	42.3	62 17.8	13.8	91 09.4	13.9	10 31.4	30.1	192 45.1	60	+19 45.8 + 75
16	252 34.0	54 06.7	43.5	77 18.8	13.1	106 11.5	13.8	25 33.6	30.2	207 10.1	60	19 53.3 + 73
17	267 36.5	69 06.2	44.7	92 19.8	12.5	121 13.5	13.6	40 35.8	30.3	221 35.1	59	20 00.6 + 73
18	282 39.0	84 05.8	- 6 46.0	107 20.8	+ 3 11.9	136 15.5	+14 13.5	55 38.1	-15 30.4	236 00.0	58	+20 07.9 + 71
19	297 41.4	99 05.4	47.2	122 21.8	11.2	151 17.5	13.3	70 40.3	30.4	250 24.8	58	20 15.0 + 70
20	312 43.9	114 05.0	48.5	137 22.8	10.6	166 19.5	13.2	85 42.5	30.5	264 49.6	57	20 22.0 + 68
21	327 46.4	129 04.6	49.7	152 23.8	9.9	181 21.6	13.1	100 44.7	30.6	279 14.3	56	+20 28.8 + 67
22	342 48.8	144 04.2	50.9	167 24.8	09.3	196 23.6	12.9	115 46.9	30.7	293 38.9	56	20 35.5 + 66
23	357 51.3	159 03.8	52.2	182 25.8	08.7	211 25.6	12.8	130 49.1	30.7	308 03.5	55	20 42.1 + 64
5 0	12 53.8	174 03.3	- 6 53.4	197 26.8	+ 3 08.0	226 27.6	+14 12.6	145 51.3	-15 30.8	322 28.0	55	+20 48.5 + 63
1	27 56.2	189 02.9	54.6	212 27.8	07.4	241 29.7	12.5	160 53.5	30.9	336 52.5	54	20 54.8 + 61
2	42 58.7	204 02.5	55.9	227 28.8	06.7	256 31.7	12.3	175 55.7	31.0	351 16.9	54	21 00.9 + 60
3	58 01.2	219 02.1	57.1	242 29.8	06.1	271 33.7	12.2	190 57.9	31.0	5 41.3	53	+21 06.9 + 59
4	73 03.6	234 01.7	58.4	257 30.8	05.5	286 35.7	12.1	206 00.2	31.1	20 05.6	53	21 12.8 + 57
5	88 06.1	249 01.3	59.6	272 31.8	04.8	301 37.8	11.9	221 02.4	31.2	34 29.9	52	21 18.5 + 56
6	103 08.5	264 00.8	- 7 00.8	287 32.7	+ 3 04.2	316 39.8	+14 11.8	236 04.6	-15 31.3	48 54.1	52	+21 24.1 + 54
7	118 11.0	279 00.4	02.1	302 33.7	03.5	331 41.8	11.6	251 06.8	31.3	63 18.3	51	21 29.5 + 53
8	133 13.5	294 00.0	03.3	317 34.7	02.9	346 43.8	11.5	266 09.0	31.4	77 42.4	51	21 34.8 + 51
9	148 15.9	308 59.6	04.5	332 35.7	02.3	1 45.9	11.3	281 11.2	31.5	92 06.5	51	+21 39.9 + 50
10	163 18.4	323 59.2	05.8	347 36.7	01.6	16 47.9	11.2	296 13.4	31.6	106 30.6	50	21 44.9 + 49
11	178 20.9	338 58.8	07.0	2 37.7	01.0	31 49.9	11.1	311 15.6	31.6	120 54.6	50	21 49.8 + 46
12	193 23.3	353 58.3	- 7 08.2	17 38.7	+ 3 00.3	46 51.9	+14 10.9	326 17.8	-15 31.7	135 18.6	49	+21 54.4 + 46
13	208 25.8	8 57.9	09.5	32 39.7	2 59.7	61 54.0	10.8	341 20.0	31.8	149 42.5	49	21 59.0 + 44
14	223 28.3	23 57.5	10.7	47 40.7	59.1	76 56.0	10.6	356 22.3	31.9	164 06.4	48	22 03.4 + 42
15	238 30.7	38 57.1	12.0	62 41.7	58.4	91 58.0	10.5	11 24.5	31.9	178 30.2	48	+22 07.6 + 41
16	253 33.2	53 56.7	13.2	77 42.7	57.8	107 00.0	10.3	26 26.7	32.0	192 54.0	48	22 11.7 + 39
17	268 35.7	68 56.2	14.4	92 43.7	57.1	122 02.1	10.2	41 28.9	32.1	207 17.8	48	22 15.6 + 38
18	283 38.1	83 55.8	- 7 15.7	107 44.7	+ 2 56.5	137 04.1	+14 10.1	56 31.1	-15 32.2	221 41.6	47	+22 19.4 + 36
19	298 40.6	98 55.4	16.9	122 45.7	55.9	152 06.1	09.9	71 33.3	32.2	236 05.3	47	+22 23.0 + 35
20	313 43.0	113 55.0	18.1	137 46.7	55.2	167 08.1	09.8	86 35.5	32.3	250 29.0	47	22 26.5 + 33
21	328 45.5	128 54.6	19.4	152 47.7	54.6	182 10.2	09.6	101 37.7	32.4	264 52.7	46	+22 29.8 + 32
22	343 48.0	143 54.1	20.6	167 48.7	53.9	197 12.2	09.5	116 39.9	32.5	279 16.3	47	+22 33.0 + 30
23	358 50.4	158 53.7	21.8	182 49.7	53.3	212 14.2	09.3	131 42.1	32.5	293 40.0	46	22 36.0 + 28
6 0	13 52.9	173 53.3	- 7 23.0	197 50.7	+ 2 52.7	227 16.2	+14 09.2	146 44.4	-15 32.6	308 03.6	46	+22 38.8 + 27
1	28 55.4	188 52.9	24.3	212 51.7	52.0	242 18.3	09.1	161 46.6	32.7	322 27.2	45	22 41.5 + 26
2	43 57.8	203 52.4	25.5	227 52.7	51.4	257 20.3	08.9	176 48.8	32.8	336 50.7	46	22 44.1 + 23
3	59 00.3	218 52.0	26.7	242 53.7	50.7	272 22.3	08.8	191 51.0	32.8	351 14.3	45	+22 46.4 + 23
4	74 02.8	233 51.6	28.0	257 54.7	50.1	287 24.4	08.6	206 53.2	32.9	5 37.8	46	22 48.7 + 20
5	89 05.2	248 51.2	29.2	272 55.7	49.5	302 26.4	08.5	221 55.4	33.0	20 01.4	45	+22 50.7 + 19
6	104 07.7	263 50.8	- 7 30.4	287 56.7	+ 2 48.8	317 28.4	+14 08.3	236 57.6	-15 33.1	34 24.9	45	+22 52.6 + 18
7	119 10.2	278 50.3	31.7	302 57.7	48.2	332 30.4	08.2	251 59.8	33.1	48 48.4	45	22 54.4 + 15
8	134 12.6	293 49.9	32.9	317 58.7	47.5	347 32.5	08.1	267 02.0	33.2	63 11.9	45	+22 55.9 + 15
9	149 15.1	308 49.5	34.1	332 59.7	46.9	2 34.5	07.9	282 04.2	33.3	77 35.4	45	+22 57.4 + 12
10	164 17.5	323 49.1	35.4	348 00.7	46.3	17 36.5	07.8	297 06.4	33.4	91 58.9	45	22 58.6 + 11
11	179 20.0	338 48.6	36.6	3 01.7	45.6	32 38.5	07.6	312 08.6	33.5	106 22.4	45	+22 59.7 + 10
12	194 22.5	353 48.2	- 7 37.8	18 02.7	+ 2 45.0	47 40.6	+14 07.5	327 10.9	-15 33.5	120 45.9	45	+23 00.7 + 8
13	209 24.9	8 47.8	39.0	33 03.7	44.3	62 42.6	07.4	342 13.1	33.6	135 09.4	45	23 01.5 + 6
14	224 27.4	23 47.4	40.3	48 04.7	43.7	77 44.6	07.2	357 15.3	33.7	149 32.9	45	23 02.1 + 5
15	239 29.9	38 46.9	41.5	63 05.7	43.0	92 46.7	07.1	12 17.5	33.8	163 56.4	45	+23 02.6 + 3
16	254 32.3	53 46.5	42.7	78 06.7	42.4	107 48.7	06.9	27 19.7	33.8	178 19.9	45	23 02.9 + 1
17	269 34.8	68 46.1	43.9	93 07.7	41.8	122 50.7	06.8	42 21.9	33.9	192 43.4	46	23 03.0 0
18	284 37.3	83 45.7	- 7 45.2	108 08.7	+ 2 41.1	137 52.8	+14 06.6	57 24.1	-15 34.0	207 07.0	45	+23 03.0 - 1
19	299 39.7	98 45.2	46.4	123 09.7	40.5	152 54.8	06.5	72 26.3	34.1	221 30.5	46	23 02.9 - 4
20	314 42.2	113 44.8	47.6	138 10.7	39.8	167 56.8	06.4	87 28.5	34.1	235 54.1	45	23 02.5 - 4
21	329 44.7	128 44.4	48.9	153 11.7	39.2	182 58.8	06.2	102 30.7	34.2	250 17.6	46	+23 02.1 - 7
22	344 47.1	143 43.9	50.1	168 12.7	38.6	198 00.9	06.1	117 32.9	34.3	264 41.2	47	23 01.4 - 8
23	359 49.6	158 43.5	51.3	183 13.7	37.9	213 02.9	05.9	132 35.1	34.4	279 04.9	46	23 00.6 - 9
24	14 52.0	173 43.1	- 7 52.5	198 14.7	+ 2 37.3	228 04.9	+14 05.8	147 37.3	-15 34.4	293 28.5	46	+22 59.7 - 12
code	-	- 4	- 13	+ 10	- 6	+ 21	- 1	+ 22	- 1			

G M T	VENUS — 3.4		MARS 2.0		JUPITER — 1.4		SATURN 0.8		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
7 0	14 52.0	173 43.1	- 7 52.5	198 14.7	+ 2 37.3	228 04.9	+14 05.8	147 37.3	-15 34.4	293 28.5	46 +22 59.7	- 12
1	29 54.5	188 42.7	53.8	213 15.7	36.6	243 07.0	05.7	162 39.5	34.5	307 52.1	47 22 58.5	- 12
2	44 57.0	203 42.2	55.0	228 16.7	36.0	258 09.0	05.5	177 41.8	34.6	322 15.8	47 22 57.3	- 15
3	59 59.4	218 41.8	56.2	243 17.7	35.4	273 11.0	05.4	192 44.0	34.7	336 39.5	48 +22 55.8	- 16
4	75 01.9	233 41.4	57.4	258 18.7	34.7	288 13.1	05.2	207 46.2	34.7	351 03.0	47 22 54.2	- 17
5	90 04.4	248 40.9	58.7	273 19.7	34.1	303 15.1	05.1	222 48.4	34.8	5 27.0	48 22 52.5	- 19
6	105 06.8	263 40.5	- 7 59.9	288 20.7	+ 2 33.4	318 17.1	+14 05.0	237 50.6	-15 34.9	19 50.8	49 +22 50.6	- 20
7	120 09.3	278 40.1	8 01.1	303 21.7	32.8	333 19.1	04.8	252 52.8	35.0	34 14.7	48 22 48.6	- 23
8	135 11.8	293 39.7	02.3	318 22.7	32.1	348 21.2	04.7	267 55.0	35.0	48 38.5	49 22 46.3	- 23
9	150 14.2	308 39.2	03.5	333 23.7	31.5	3 23.2	04.5	282 57.2	35.1	63 02.4	50 +22 44.0	- 25
10	165 16.7	323 38.8	04.8	348 24.7	30.9	18 25.2	04.4	297 59.4	35.2	77 26.4	50 22 41.5	- 27
11	180 19.1	338 38.4	06.0	3 25.7	30.2	33 27.3	04.2	313 01.6	35.3	91 50.4	50 22 38.8	- 28
12	195 21.6	353 37.9	- 8 07.2	18 26.7	+ 2 29.6	48 29.3	+14 04.1	328 03.8	-15 35.3	106 14.4	50 +22 36.0	- 30
13	210 24.1	8 37.5	08.4	33 27.7	28.9	63 31.3	04.0	343 06.0	35.4	120 38.4	51 22 33.0	- 31
14	225 26.5	23 37.1	09.7	48 28.7	28.3	78 33.4	03.8	358 08.2	35.5	135 02.5	52 22 29.9	- 33
15	240 29.0	38 36.6	10.9	63 29.7	27.7	93 35.4	03.7	13 10.4	35.6	149 26.7	52 +22 26.6	- 34
16	255 31.5	53 36.2	12.1	78 30.7	27.0	108 37.4	03.5	28 12.6	35.7	163 50.9	52 22 23.2	- 36
17	270 33.9	68 35.8	13.3	93 31.7	26.4	123 39.5	03.4	43 14.8	35.7	178 15.1	53 22 19.6	- 37
18	285 36.4	83 35.3	- 8 14.5	108 32.7	+ 2 25.7	138 41.5	+14 03.3	58 17.0	-15 35.8	192 39.4	54 +22 15.9	- 38
19	300 38.9	98 34.9	15.8	123 33.7	25.1	153 43.5	03.1	73 19.2	35.9	207 03.8	53 22 12.1	- 40
20	315 41.3	113 34.5	17.0	138 34.7	24.4	168 45.6	03.0	88 21.5	36.0	221 28.1	55 22 08.1	- 42
21	330 43.8	128 34.0	18.2	153 35.7	23.8	183 47.6	02.8	103 23.7	36.0	235 52.6	55 +22 03.9	- 43
22	345 46.3	143 33.6	19.4	168 36.7	23.2	198 49.6	02.7	118 25.9	36.1	250 17.1	56 21 59.6	- 44
23	0 48.7	158 33.2	20.6	183 37.7	22.5	213 51.7	02.6	133 28.1	36.2	264 41.7	56 21 55.2	- 46
8 0	15 51.2	173 32.7	- 8 21.8	198 38.7	+ 2 21.9	228 53.7	+14 02.4	148 30.3	-15 36.3	279 06.3	56 +21 50.6	- 47
1	30 53.6	188 32.3	23.1	213 39.7	21.2	243 55.7	02.3	163 32.5	36.3	293 30.9	57 21 45.9	- 49
2	45 56.1	203 31.8	24.3	228 40.7	20.6	258 57.8	02.1	178 34.7	36.4	307 55.7	57 21 41.0	- 50
3	60 58.6	218 31.4	25.5	243 41.7	20.0	273 59.8	02.0	193 36.9	36.5	322 20.4	59 +21 36.0	- 52
4	76 01.0	233 31.0	26.7	258 42.7	19.3	289 01.8	01.9	208 39.1	36.6	336 45.3	59 21 30.8	- 53
5	91 03.5	248 30.5	27.9	273 43.7	18.7	304 03.9	01.7	223 41.3	36.6	351 10.2	60 21 25.5	- 54
6	106 06.0	263 30.1	- 8 29.1	288 44.7	+ 2 18.0	319 05.9	+14 01.6	238 43.5	-15 36.7	5 35.2	60 +21 20.1	- 55
7	121 08.4	278 29.7	30.4	303 45.7	17.4	334 07.9	01.4	253 45.7	36.8	20 00.2	61 21 14.6	- 57
8	136 10.9	293 29.2	31.6	318 46.7	16.7	349 10.0	01.3	268 47.9	36.9	34 25.3	62 21 08.9	- 58
9	151 13.4	308 28.8	32.8	333 47.7	16.1	4 12.0	01.2	283 50.1	36.9	48 50.5	62 +21 03.1	- 60
10	166 15.8	323 28.4	34.0	348 48.7	15.5	19 14.1	01.0	298 52.3	37.0	63 15.7	63 20 57.1	- 61
11	181 18.3	338 27.9	35.2	3 49.7	14.8	34 16.1	00.9	313 54.5	37.1	77 41.0	64 20 51.0	- 62
12	196 20.8	353 27.5	- 8 36.4	18 50.7	+ 2 14.2	49 18.1	+14 00.7	328 56.7	-15 37.2	92 06.4	64 +20 44.8	- 64
13	211 23.2	8 27.0	37.6	33 51.7	13.5	64 20.2	00.6	343 58.9	37.3	106 31.8	65 20 38.4	- 66
14	226 25.7	23 26.6	38.9	48 52.7	12.9	79 22.2	00.5	359 01.1	37.3	120 57.3	66 20 32.0	- 64
15	241 28.1	38 26.2	40.1	63 53.7	12.2	94 24.2	00.3	14 03.3	37.4	135 22.9	67 20 25.4	- 68
16	256 30.6	53 25.7	41.3	78 54.7	11.6	109 26.3	00.2	29 05.5	37.5	149 48.6	67 20 18.6	- 68
17	271 33.1	68 25.3	42.5	93 55.7	11.0	124 28.3	14 00.0	44 07.7	37.6	164 14.3	68 20 11.8	- 70
18	286 35.5	83 24.8	- 8 43.7	108 56.7	+ 2 10.3	139 30.3	+13 59.9	59 09.9	-15 37.6	178 40.1	68 +20 04.8	- 71
19	301 38.0	98 24.4	44.9	123 57.7	09.7	154 32.4	59.8	74 12.2	37.7	193 05.9	70 19 57.7	- 72
20	316 40.5	113 23.9	46.1	138 58.7	09.0	169 34.4	59.6	89 14.4	37.8	207 31.9	70 19 50.5	- 74
21	331 42.9	128 23.5	47.3	153 59.7	08.4	184 36.5	59.5	104 16.6	37.9	221 57.9	71 +19 43.1	- 74
22	346 45.4	143 23.1	48.6	169 00.7	07.8	199 38.5	59.3	119 18.8	37.9	236 24.0	71 19 35.7	- 76
23	1 47.9	158 22.6	49.8	184 01.7	07.1	214 40.5	59.2	134 21.0	38.0	250 50.1	73 19 28.1	- 77
9 0	16 50.3	173 22.2	- 8 51.0	199 02.7	+ 2 06.5	229 42.6	+13 59.1	149 23.2	-15 38.1	265 16.4	73 +19 20.4	- 78
1	31 52.8	188 21.7	52.2	214 03.7	05.8	244 44.6	58.9	164 25.4	38.2	279 42.7	74 19 12.6	- 80
2	46 55.3	203 21.3	53.4	229 04.7	05.2	259 46.6	58.8	179 27.6	38.2	294 09.1	74 19 04.6	- 80
3	61 57.7	218 20.8	54.6	244 05.7	04.5	274 48.7	58.6	194 29.8	38.3	308 35.5	75 +18 56.6	- 81
4	77 00.2	233 20.4	55.8	259 06.7	03.9	289 50.7	58.5	209 32.0	38.4	323 02.0	77 18 48.5	- 83
5	92 02.6	248 20.0	57.0	274 07.7	03.3	304 52.8	58.4	224 34.2	38.5	337 28.7	76 18 40.2	- 84
6	107 05.1	263 19.5	- 8 58.2	289 08.7	+ 2 02.6	319 54.8	+13 58.2	239 36.4	-15 38.5	351 55.3	78 +18 31.8	- 84
7	122 07.6	278 19.1	8 59.4	304 09.7	02.0	334 56.8	58.1	254 38.6	38.6	6 22.1	79 18 23.4	- 86
8	137 10.0	293 18.6	9 00.6	319 10.7	01.3	349 58.9	57.9	269 40.8	38.7	20 49.9	79 18 14.8	- 87
9	152 12.5	308 18.2	01.9	334 11.7	00.7	5 00.9	57.8	284 43.0	38.8	35 15.9	80 +18 06.1	- 88
10	167 15.0	323 17.7	03.1	349 12.7	2 00.0	20 03.0	57.7	299 45.2	38.9	49 42.9	80 17 57.3	- 89
11	182 17.4	338 17.3	04.3	4 13.7	1 59.4	35 05.0	57.5	314 47.4	38.9	64 09.9	82 17 48.4	- 90
12	197 19.9	353 16.8	- 9 05.5	19 14.7	+ 1 58.8	50 07.0	+13 57.4	329 49.6	-15 39.0	78 37.1	82 +17 39.4	- 91
13	212 22.4	8 16.4	06.7	34 15.7	58.1	65 09.1	57.3	344 51.8	39.1	93 04.3	83 17 30.3	- 92
14	227 24.8	23 15.9	07.9	49 16.7	57.5	80 11.1	57.1	359 54.0	39.2	107 31.6	84 17 21.1	- 93
15	242 27.3	38 15.5	09.1	64 17.7	56.8	95 13.2	57.0	14 56.2	39.2	121 59.0	85 17 11.8	- 94
16	257 29.7	53 15.0	10.3	79 18.7	56.2	110 15.2	56.8	29 58.4	39.3	136 26.5	85 17 02.4	- 94
17	272 32.2	68 14.6	11.5	94 19.7	55.5	125 17.2	56.7	45 00.6	39.4	150 54.0	86 16 53.0	- 96
18	287 34.7	83 14.2	- 9 12.7	109 20.7	+ 1 54.9	140 19.3	+13 56.6	60 02.8	-15 39.5	165 21.6	87 +16 43.4	- 97
19	302 37.1	98 13.7	13.9	124 21.7	54.3	155 21.3	56.4	75 05.0	39.5	179 49.3	88 16 33.7	- 97
20	317 39.6	113 13.3	15.1	139 22.7	53.6	170 23.4	56.3	90 07.2	39.6	194 17.1	88 16 24.0	- 99
21	332 42.1	128 12.8	16.3	154 23.7	53.0	185 25.4	56.1	105 09.4	39.7	208 44.9	89 +16 14.1	- 99
22	347 44.5	143 12.4	17.5	169 24.7	52.3	200 27.4	56.0	120 11.6	39.8	223 12.8	90 16 04.2	- 101
23	2 47.0	158 11.9	18.7	184 25.7	51.7	215 29.5	55.9	135 13.8	39.9	237 40.8	91 15 54.1	- 101
24	17 49.5	173 11.5	- 9 19.9	199 26.7	+ 1 51.0	230 31.5	+13 55.7	150 16.0	-15 39.9	252 08.9	91 +15 44.0	- 101
code	-	- 5	- 12	+ 10	- 7	+ 21	- 1	+ 22	- 1			

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS				
	GHA	Dec.	No.	Name	SHA	Dec.												
										7	8	9	10	Alt.	Sun's Low'r Limb Add	Venus Add	Mars Add	
70	182 57.4	- 5 06.9	7	Acamar	315 50.7	-40 28.6	72	6 47	2 45	□	□	20 54	23 29	Alt.				
1	197 57.6	07.9	5	Achernar	335 58.2	-57 27.4	70	6 41	3 06	□	18 34	21 39	23 49					
2	212 57.8	08.8	30	Acruz	173 58.5	-62 51.3	68	6 35	3 22	□	20 01	22 08	24 04					
3	227 58.0	09.8	19	Adhara	255 46.5	-28 54.4	66	6 31	3 33	18 49	20 39	22 30	24 17					
4	242 58.2	10.7	10	Aldebaran	291 38.8	+16 25.4	64	6 27	3 44	19 29	21 05	22 47	24 27					
5	257 58.4	11.7					62	6 23	3 52	19 56	21 26	23 01	24 36	0	0.3	0.1	0.1	
6	272 58.5	- 5 12.7	32	Alioth	166 59.1	+56 11.9	60	6 20	3 59	20 18	21 43	23 13	24 44	30	0.3	0.1	0.0	
7	287 58.7	13.6	34	Alkaid	153 33.3	+49 32.1	58	6 18	4 05	20 35	21 57	23 23	24 50	45	0.3	0.1	0.0	
8	302 58.9	14.6	55	Al Na'ir	28 37.6	-47 10.5	56	6 15	4 09	20 50	22 09	23 32	24 56	60	0.3	0.0	0.0	
9	317 59.1	15.5	15	Alnilam	276 30.1	- 1 13.6	54	6 13	4 13	21 02	22 19	23 40	25 01	75	0.3	0.0	0.0	
10	332 59.3	16.5	25	Alphard	218 38.8	- 8 27.9	52	6 11	4 18	21 13	22 29	23 47	25 06	90				
11	347 59.5	17.4					50	6 10	4 21	21 23	22 37	23 54	25 10					
12	2 59.6	- 5 18.4	41	Alphecca	126 47.9	+26 51.9	45	6 06	4 27	21 44	22 54	24 07	0 07	Moon's Lower Limb				
13	17 59.8	19.4	1	Alpheratz	358 28.0	+28 51.0	40	6 02	4 31	22 01	23 09	24 18	0 18	Add				
14	33 00.0	20.3	51	Altair	62 50.3	+ 8 45.3	35	6 00	4 35	22 15	23 21	24 28	0 28	Alt.	7	8	9	
15	48 00.2	21.3	2	Ankaa	353 57.8	-42 32.6	30	5 57	4 37	22 27	23 32	24 36	0 36					
16	63 00.4	22.2	42	Antares	113 19.6	-26 20.2	20	5 52	4 39	22 48	23 50	24 51	0 51	0	18.6	18.2	17.8	
17	78 00.5	23.2					10	5 48	4 38	23 06	24 06	0 06	1 03	4	18.6	18.2	17.8	
18	93 00.7	- 5 24.2	37	Arcturus	146 35.5	+19 24.8	0	5 44	4 36	23 23	24 20	0 20	1 15	8	18.6	18.2	17.8	
19	108 00.9	25.1	43	Atria	109 00.5	-68 57.2	10	5 40	4 31	23 40	24 35	0 35	1 26	12	18.5	18.2	17.8	
20	123 01.1	26.1	22	Avior	234 36.0	-59 21.7	20	5 36	4 23	23 58	24 51	0 51	1 39	16	18.5	18.1	17.8	
21	138 01.3	27.0	13	Bellatrix	279 18.3	+ 6 18.8	30	5 31	4 11	24 19	0 19	1 09	1 53	20	18.4	18.1	17.7	
22	153 01.4	28.0	16	Betelge'se	271 48.0	+ 7 24.1	35	5 28	4 02	24 31	0 31	1 19	2 01	24	18.4	18.0	17.7	
23	168 01.6	28.9					40	5 24	3 53	24 45	0 45	1 31	2 10	28	18.3	17.9	17.6	
			17	Canopus	264 15.3	-52 39.9	45	5 20	3 39	0 08	1 01	1 45	2 21	32	18.2	17.9	17.5	
80	183 01.8	- 5 29.9	12	Capella	281 38.2	+45 57.2	50	5 16	3 23	0 30	1 21	2 02	2 34	36	18.1	17.8	17.5	
1	198 02.0	30.9	53	Deneb	50 00.8	+45 07.7	52	5 13	3 14	0 41	1 31	2 10	2 40	40	18.0	17.7	17.4	
2	213 02.2	31.8	28	Denebola	183 18.0	+14 49.2	54	5 11	3 04	0 52	1 42	2 19	2 47	44	17.9	17.6	17.3	
3	228 02.3	32.8	4	Diphda	349 38.9	-18 13.5	56	5 08	2 53	1 06	1 54	2 29	2 54	48	17.7	17.5	17.2	
4	243 02.5	33.7					58	5 06	2 39	1 22	2 08	2 40	3 02	52	17.6	17.4	17.1	
5	258 02.7	34.7	27	Dubhe	194 45.1	+61 59.2	60	5 02	2 22	1 41	2 25	2 53	3 12	56	17.5	17.2	17.0	
6	273 02.9	- 5 35.6	14	Elnath	279 07.1	+28 34.3	S							60	17.3	17.1	16.9	
7	288 03.1	36.6	47	Eltanin	91 06.4	+51 29.9		Lat.	Sunset	Twlt. ends	Moonset				64	17.2	17.0	16.8
8	303 03.2	37.6	54	Enif	34 29.4	+ 9 40.6		N.			7	8	9	10	68	17.0	16.8	16.7
9	318 03.4	38.5	56	Fomalhaut	16 11.3	-29 51.3		h m	h m		h m	h m	h m	h m	72	16.9	16.7	16.5
10	333 03.6	39.5						h m	h m	h m	h m	h m	h m	76	16.7	16.6	16.4	
11	348 03.8	40.4	31	Gacrux	172 49.8	-56 51.9	72	16 46	20 42	□	□	17 26	16 40	80	16.5	16.4	16.3	
12	3 03.9	- 5 41.4	29	Gienah	176 37.2	-17 17.7	70	16 53	20 23	□	17 48	16 40	16 18	84	16.4	16.3	16.2	
13	18 04.1	42.3	35	Hadar	149 50.0	-60 09.7	68	16 59	20 09	□	16 22	16 09	16 00	88	16.2	16.2	16.1	
14	33 04.3	43.3	6	Hamal	328 49.3	+23 15.4	66	17 03	19 56	15 31	15 43	15 46	15 47	90	Add to table, back cover			
15	48 04.5	44.2	48	Kaus Aust.	84 41.2	-34 24.5	64	17 07	19 47	14 51	15 15	15 28	15 35		Moon's Upper Limb			
16	63 04.7	45.2					62	17 11	19 40	14 23	14 54	15 13	15 25		Subtract			
17	78 04.8	46.2	40	Kochab	137 18.9	+74 20.3	60	17 14	19 33	14 01	14 37	15 00	15 16	Alt.	7	8	9	
18	93 05.0	- 5 47.1	57	Makab	14 21.1	+14 58.3	58	17 17	19 28	13 44	14 22	14 49	15 09	0	13.8	14.0	14.2	
19	108 05.2	48.1	8	Menkar	315 00.0	+ 3 55.2	56	17 19	19 23	13 29	14 10	14 40	15 02	4	13.8	14.0	14.3	
20	123 05.4	49.0	36	Menkent	148 59.0	-36 09.2	54	17 21	19 19	13 16	13 59	14 31	14 56	12	13.9	14.1	14.3	
21	138 05.5	50.0	24	Miapl'dus	221 49.5	-69 31.9	52	17 23	19 15	13 05	13 49	14 24	14 51	16	13.9	14.1	14.3	
22	153 05.7	50.9					50	17 25	19 12	12 55	13 41	14 17	14 46	20	14.0	14.2	14.4	
23	168 05.9	51.9	9	Mirfak	309 41.9	+49 42.3	45	17 29	19 06	12 34	13 22	14 02	14 35	24	14.0	14.2	14.4	
			50	Nunki	76 51.9	-26 21.2	40	17 32	19 02	12 16	13 07	13 50	14 26	28	14.1	14.3	14.5	
90	183 06.1	- 5 52.8	52	Peacock	54 27.0	-56 52.8	35	17 35	18 59	12 02	12 54	13 39	14 18	32	14.2	14.4	14.5	
1	198 06.2	53.8	21	Pollux	244 20.6	+28 08.0	30	17 38	18 57	11 49	12 43	13 30	14 12	36	14.3	14.5	14.6	
2	213 06.4	54.8	20	Procyon	245 45.0	+ 5 20.4	20	17 43	18 56	11 28	12 23	13 14	14 00	40	14.4	14.6	14.7	
3	228 06.6	55.7					10	17 47	18 57	11 09	12 07	13 00	13 49	44	14.5	14.7	14.8	
4	243 06.8	56.7	46	R'halague	96 46.7	+12 35.6	0	17 51	19 00	10 52	11 51	12 47	13 39	48	14.7	14.8	14.9	
5	258 06.9	57.6	26	Regulus	208 29.7	+12 11.0	10	17 55	19 05	10 34	11 35	12 33	13 29	52	14.8	14.9	15.0	
6	273 07.1	- 5 58.6	11	Rigel	281 53.5	- 8 14.9	20	18 00	19 14	10 15	11 17	12 19	13 19	56	14.9	15.0	15.1	
7	288 07.3	5 59.5	38	Rigel Kent.	140 51.6	-60 39.4	30	18 05	19 26	9 53	10 58	12 03	13 07	60	15.1	15.1	15.2	
8	303 07.4	6 00.5	44	Sabik	103 02.3	-15 40.3	35	18 08	19 35	9 41	10 46	11 53	12 59	64	15.2	15.3	15.3	
9	318 07.6	01.4					40	18 12	19 46	9 26	10 33	11 42	12 51	68	15.4	15.4	15.4	
10	333 07.8	02.4	3	Schedar	350 29.4	+56 17.9	45	18 16	19 59	9 08	10 17	11 29	12 42	72	15.5	15.5	15.5	
11	348 08.0	03.3	45	Shaula	97 20.8	-37 04.5	50	18 21	20 17	8 46	9 57	11 13	12 30	76	15.7	15.7	15.7	
12	3 08.1	- 6 04.3	18	Sirius	259 11.8	-16 39.1	52	18 23	20 25	8 36	9 48	11 05	12 25	80	15.9	15.8	15.8	
13	18 08.3	05.2	33	Spica	159 17.2	-10 55.8	54	18 26	20 36	8 24	9 37	10 57	12 19	84	16.0	16.0	15.9	
14	33 08.5	06.2	23	Shuail	223 24.5	-43 15.0	56	18 29	20 48	8 10	9 25	10 48	12 12	88	16.2	16.1	16.0	
15	48 08.7	07.1					58	18 32	21 03	7 55	9 12	10 37	12 04	90	Subtract from table, back cover			
16	63 08.8	08.1	49	Vega	81 08.3	+38 44.8	60	18 35	21 20	7 36								

G M T	T	VENUS - 3.4			MARS 2.0			JUPITER - 1.4			SATURN 0.8			MOON			
		GHA	Dec.		GHA	Dec.		GHA	Dec.		GHA	Dec.		GHA	code	Dec.	code
10	0	17 49.5	173 11.5	- 9 19.9	199 26.7	+ 1 51.0		230 31.5	+13 55.7		150 16.0	-15 39.9		252 08.9	91	+15 44.0	-101
	1	32 51.9	188 11.0	21.1	214 27.7	50.4		245 33.6	55.6		165 18.2	40.0		266 37.0	93	15 33.9	-103
	2	47 54.4	203 10.6	22.3	229 28.7	49.8		260 35.6	55.5		180 20.4	40.1		281 05.3	93	15 23.6	-104
	3	62 56.9	218 10.1	23.5	244 29.7	49.1		275 37.6	55.3		195 22.6	40.2		295 33.6	93	15 13.2	-104
	4	77 59.3	233 09.6	24.7	259 30.7	48.5		290 39.7	55.2		210 24.8	40.2		310 01.9	95	15 02.8	-105
	5	93 01.8	248 09.2	25.9	274 31.6	47.8		305 41.7	55.0		225 27.0	40.3		324 30.4	95	14 52.3	-106
	6	108 04.2	263 08.7	- 9 27.1	289 32.6	+ 1 47.2		320 43.8	+13 54.9		240 29.2	-15 40.4		338 58.9	96	+14 41.7	-107
	7	123 06.7	278 08.3	28.3	304 33.6	46.5		335 45.8	54.8		255 31.4	40.5		353 27.5	96	14 31.0	-107
	8	138 09.2	293 07.8	29.5	319 34.6	45.9		350 47.9	54.6		270 33.6	40.5		7 56.1	98	14 20.3	-109
	9	153 11.6	308 07.4	30.7	334 35.6	45.3		5 49.9	54.5		285 35.8	40.6		22 24.9	98	14 09.4	-108
10	10	168 14.1	323 06.9	31.9	349 36.6	44.6		20 51.9	54.3		300 38.0	40.7		36 53.7	98	13 58.6	-110
	11	183 16.6	338 06.5	33.1	4 37.6	44.0		35 54.0	54.2		315 40.2	40.8		51 22.5	100	13 47.6	-110
	12	198 19.0	353 06.0	- 9 34.3	19 38.6	+ 1 43.3		50 56.0	+13 54.1		330 42.4	-15 40.8		65 51.5	100	+13 36.6	-111
	13	213 21.5	8 05.6	35.5	34 39.6	42.7		65 58.1	53.9		345 44.6	40.9		80 20.5	101	13 25.5	-112
	14	228 24.0	23 05.1	36.7	49 40.6	42.0		81 00.1	53.8		0 46.8	41.0		94 49.6	102	13 14.3	-112
	15	243 26.4	38 04.7	37.9	64 41.6	41.4		96 02.2	53.7		15 49.0	41.1		109 18.8	102	13 03.1	-113
	16	258 28.9	53 04.2	39.1	79 42.6	40.8		111 04.2	53.5		30 51.2	41.2		123 48.0	103	12 51.8	-114
	17	273 31.4	68 03.7	40.3	94 43.6	40.1		126 06.3	53.4		45 53.4	41.2		138 17.3	103	12 40.4	-114
	18	288 33.8	83 03.3	- 9 41.5	109 44.6	+ 1 39.5		141 08.3	+13 53.2		60 55.6	-15 41.3		152 46.6	105	+12 29.0	-115
	19	303 36.3	98 02.8	42.7	124 45.6	38.8		156 10.3	53.1		75 57.8	41.4		167 16.1	104	12 17.5	-115
	20	318 38.7	113 02.4	43.9	139 46.6	38.2		171 12.4	53.0		91 00.0	41.5		181 45.5	106	12 06.0	-116
	21	333 41.2	128 01.9	45.1	154 47.6	37.5		186 14.4	52.8		106 02.2	41.5		196 15.1	106	11 54.4	-117
	22	348 43.7	143 01.5	46.3	169 48.6	36.9		201 16.5	52.7		121 04.4	41.6		210 44.7	107	11 42.7	-117
	23	3 46.1	158 01.0	47.4	184 49.6	36.3		216 18.5	52.6		136 06.6	41.7		225 14.4	108	11 31.0	-118
11	0	18 48.6	173 00.5	- 9 48.6	199 50.6	+ 1 35.6		231 20.6	+13 52.4		151 08.8	-15 41.8		239 44.2	108	+11 19.2	-118
	1	33 51.1	188 00.1	49.8	214 51.6	35.0		246 22.6	52.3		166 11.0	41.8		254 14.0	109	11 07.4	-119
	2	48 53.5	202 59.6	51.0	229 52.6	34.3		261 24.7	52.1		181 13.2	41.9		268 43.9	109	10 55.5	-119
	3	63 56.0	217 59.2	52.2	244 53.6	33.7		276 26.7	52.0		196 15.4	42.0		283 13.8	110	10 43.6	-120
	4	78 58.5	232 58.7	53.4	259 54.6	33.0		291 28.7	51.9		211 17.6	42.1		297 43.8	111	10 31.6	-120
	5	94 00.9	247 58.2	54.6	274 55.6	32.4		306 30.8	51.7		226 19.8	42.2		312 13.9	111	10 19.6	-120
	6	109 03.4	262 57.8	- 9 55.8	289 56.6	+ 1 31.7		321 32.8	+13 51.6		241 22.0	-15 42.2		326 44.0	112	+10 07.6	-122
	7	124 05.8	277 57.3	57.0	304 57.6	31.1		336 34.9	51.5		256 24.2	42.3		341 14.2	112	9 55.4	-121
	8	139 08.3	292 56.9	58.2	319 58.6	30.5		351 36.9	51.3		271 26.4	42.4		355 44.4	113	9 43.3	-122
	9	154 10.8	307 56.4	9 59.4	334 59.6	29.8		6 39.0	51.2		286 28.6	42.5		10 14.7	113	9 31.1	-123
10	10	169 13.2	322 55.9	10 00.5	350 00.6	29.2		21 41.0	51.1		301 30.8	42.5		24 45.0	114	9 18.8	-122
	11	184 15.7	337 55.5	01.7	5 01.6	28.5		36 43.1	50.9		316 33.0	42.6		39 15.4	115	9 06.6	-124
	12	199 18.2	352 55.0	-10 02.9	20 02.6	+ 1 27.9		51 45.1	+13 50.8		331 35.2	-15 42.7		53 45.9	115	+ 8 54.2	-123
	13	214 20.6	7 54.5	04.1	35 03.6	27.2		66 47.2	50.6		346 37.4	42.8		68 16.4	116	8 41.9	-124
	14	229 23.1	22 54.1	05.3	50 04.6	26.6		81 49.2	50.5		1 39.6	42.8		82 47.0	116	8 29.5	-124
	15	244 25.6	37 53.6	06.5	65 05.6	26.0		96 51.3	50.4		16 41.8	42.9		97 17.6	117	8 17.1	-125
	16	259 28.0	52 53.1	07.7	80 06.6	25.3		111 53.3	50.2		31 44.0	43.0		111 48.3	117	8 04.6	-125
	17	274 30.5	67 52.7	08.9	95 07.6	24.7		126 55.4	50.1		46 46.2	43.1		126 19.0	117	7 52.1	-125
	18	289 33.0	82 52.2	-10 10.0	110 08.6	+ 1 24.0		141 57.4	+13 50.0		61 48.4	-15 43.2		140 49.7	119	+ 7 39.6	-126
	19	304 35.4	97 51.7	11.2	125 09.6	23.4		156 59.5	49.8		76 50.6	43.2		155 20.6	118	7 27.0	-126
	20	319 37.9	112 51.3	12.4	140 10.6	22.7		172 01.5	49.7		91 52.8	43.3		169 51.4	120	7 14.4	-126
	21	334 40.3	127 50.8	13.6	155 11.6	22.1		187 03.6	49.5		106 55.0	43.4		184 22.4	119	7 01.8	-127
	22	349 42.8	142 50.3	14.8	170 12.6	21.5		202 05.6	49.4		121 57.2	43.5		198 53.3	120	6 49.1	-127
	23	4 45.3	157 49.9	16.0	185 13.6	20.8		217 07.7	49.3		136 59.4	43.5		213 24.3	121	6 36.4	-127
12	0	19 47.7	172 49.4	-10 17.1	200 14.6	+ 1 20.2		232 09.7	+13 49.1		152 01.6	-15 43.6		227 55.4	121	+ 6 23.7	-127
	1	34 50.2	187 48.9	18.3	215 15.6	19.5		247 11.8	49.0		167 03.8	43.7		242 26.5	121	6 11.0	-127
	2	49 52.7	202 48.5	19.5	230 16.6	18.9		262 13.8	48.9		182 06.0	43.8		256 57.6	122	5 58.3	-128
	3	64 55.1	217 48.0	20.7	245 17.6	18.2		277 15.9	48.7		197 08.2	43.8		271 28.8	122	5 45.5	-128
	4	79 57.6	232 47.5	21.9	260 18.6	17.6		292 17.9	48.6		212 10.4	43.9		286 00.0	123	5 32.7	-128
	5	95 00.1	247 47.1	23.1	275 19.6	16.9		307 19.9	48.5		227 12.6	44.0		300 31.3	123	5 19.9	-128
	6	110 02.5	262 46.6	-10 24.2	290 20.6	+ 1 16.3		322 22.0	+13 48.3		242 14.8	-15 44.1		315 02.6	124	+ 5 07.1	-129
	7	125 05.0	277 46.1	25.4	305 21.6	15.7		337 24.0	48.2		257 16.9	44.2		329 34.0	123	4 54.2	-128
	8	140 07.5	292 45.7	26.6	320 22.6	15.0		352 26.1	48.1		272 19.1	44.2		344 05.3	125	4 41.4	-129
	9	155 09.9	307 45.2	27.8	335 23.6	14.4		7 28.2	47.9		287 21.3	44.3		358 36.8	124	4 28.5	-129
10	10	170 12.4	322 44.7	29.0	350 24.6	13.7		22 30.2	47.8		302 23.5	44.4		13 08.2	125	4 15.6	-129
	11	185 14.8	337 44.2	30.1	5 25.6	13.1		37 32.3	47.6		317 25.7	44.5		27 39.7	125	4 02.7	-129
	12	200 17.3	352 43.8	-10 31.3	20 26.6	+ 1 12.4		52 34.3	+13 47.5		332 27.9	-15 44.5		42 11.2	126	+ 3 49.8	-129
	13	215 19.8	7 43.3	32.5	35 27.6	11.8		67 36.4	47.4		347 30.1	44.6		56 42.8	126	3 36.9	-130
	14	230 22.2	22 42.8	33.7	50 28.6	11.2		82 38.4	47.2		2 32.3	44.7		71 14.4	126	3 23.9	-129
	15	245 24.7	37 42.4	34.9	65 29.6	10.5		97 40.5	47.1		17 34.5	44.8		85 46.0	127	3 11.0	-130
	16	260 27.2	52 41.9	36.0	80 30.6	09.9		112 42.5	47.0		32 36.7	44.8		100 17.7	127	2 58.0	-129
	17	275 29.6	67 41.4	37.2	95 31.6	09.2		127 44.6	46.8		47 38.9	44.9		114 49.4	127	2 45.1	-130
	18	290 32.1	82 40.9	-10 38.4	110 32.6	+ 1 08.6		142 46.6	+13 46.7		62 41.1	-15 45.0		129 21.1	128	+ 2 32.1	-130
	19	305 34.6	97 40.5	39.6	125 33.6	07.9		157 48.7	46.6		77 43.3	45.1		143 52.9	127	2 19.1	-129
	20	320 37.0	112 40.0	40.7	140 34.6	07.3		172 50.7	46.4		92 45.5	45.2		158 24.6	128	2 06.2	-130
	21	335 39.5	127 39.5	41.9	155 35.6	06.6		187 52.8	46.3		107 47.7	45.2		172 56.4	129	1 53.2	-130

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.	No.	Name	SHA	Dec.								Alt.	Sun's Low'r Limb Add	Venus Add	Mars Add		
										10	11	12	13						
10	183 10.2	- 6 15.7	7	Acamar	315 50.7	-40 28.6	72	7 01	3 03	23 29	25 37	1 37	3 37						
1	198 10.4	16.7	5	Achernar	335 58.2	-57 27.5	70	6 53	3 21	23 49	25 46	1 46	3 37						
2	213 10.5	17.6	30	Acruz	173 58.5	-62 51.2	68	6 46	3 33	24 04	0 04	1 53	3 38						
3	228 10.7	18.6	19	Adhara	255 46.5	-28 54.4	66	6 40	3 44	24 17	0 17	1 59	3 38						
4	243 10.9	19.5	10	Aldebaran	291 38.8	+16 25.4	64	6 35	3 54	24 27	0 27	2 04	3 38						
5	258 11.0	20.5					62	6 31	4 01	24 36	0 36	2 08	3 38						
6	273 11.2	- 6 21.4	32	Alioth	166 59.1	+56 11.9	60	6 28	4 06	24 44	0 44	2 12	3 39						
7	288 11.4	22.4	34	Alkaid	153 33.3	+49 32.0	58	6 24	4 11	24 50	0 50	2 16	3 39						
8	303 11.5	23.3	55	Al Na'ir	28 37.6	-47 10.5	56	6 21	4 15	24 56	0 56	2 18	3 39						
9	318 11.7	24.3	15	Alnilam	276 30.1	- 1 13.6	54	6 19	4 19	25 01	1 01	2 21	3 39						
10	333 11.9	25.2	25	Alphard	218 38.7	- 8 27.9	52	6 16	4 23	25 06	1 06	2 23	3 39						
11	348 12.1	26.2					50	6 14	4 26	25 10	1 10	2 26	3 39						
12	3 12.2	- 6 27.1	41	Alphecca	126 47.9	+26 51.9	45	6 09	4 31	0 07	1 20	2 30	3 40						
13	18 12.4	28.1	1	Alpheratz	358 28.0	+28 51.0	40	6 05	4 34	0 18	1 27	2 34	3 40						
14	33 12.6	29.0	51	Altair	62 50.4	+ 8 45.3	35	6 02	4 37	0 28	1 34	2 38	3 40						
15	48 12.7	30.0	2	Ankaa	353 57.8	-42 32.6	30	5 59	4 39	0 36	1 39	2 41	3 40						
16	63 12.9	30.9	42	Antares	113 19.6	-26 20.1	20	5 53	4 40	0 51	1 49	2 46	3 41						
17	78 13.1	31.9					10	5 48	4 38	1 03	1 58	2 50	3 41						
18	93 13.2	- 6 32.8	37	Arcturus	146 35.5	+19 24.8	0	5 44	4 35	1 15	2 06	2 54	3 41						
19	108 13.4	33.8	43	Atria	109 00.6	-68 57.2	10	5 39	4 28	1 26	2 14	2 59	3 42						
20	123 13.6	34.7	22	Avior	234 36.0	-59 21.7	20	5 34	4 20	1 39	2 22	3 03	3 42						
21	138 13.7	35.6	13	Bellatrix	279 18.2	+ 6 18.8	30	5 27	4 07	1 53	2 32	3 08	3 42						
22	153 13.9	36.6	16	Betelge'se	271 48.0	+ 7 24.1	35	5 24	3 58	2 01	2 38	3 11	3 43						
23	168 14.1	37.5					40	5 20	3 47	2 10	2 44	3 14	3 43						
			17	Canopus	264 15.2	-52 39.9	45	5 15	3 33	2 21	2 52	3 18	3 43						
			12	Capella	281 38.1	+45 57.2	50	5 09	3 14	2 34	3 00	3 23	3 44						
			53	Deneb	50 00.8	+45 07.7	52	5 07	3 05	2 40	3 04	3 25	3 44						
			28	Denebola	183 18.0	+14 49.1	54	5 04	2 54	2 47	3 09	3 27	3 44						
			4	Diphda	349 38.9	-18 13.5	56	5 00	2 41	2 54	3 14	3 30	3 44						
							58	4 57	2 27	3 02	3 19	3 33	3 45						
			27	Dubhe	194 45.1	+61 59.2	60	4 53	2 07	3 12	3 25	3 36	3 45						
			14	Elnath	279 07.1	+28 34.3	S												
			47	Eltanin	91 06.4	+51 29.9		Lat.	Sunset	Twlt. ends	Moonset								
			54	Enif	34 29.4	+ 9 40.6		N			10	11	12	13					
			56	Fomalhaut	16 11.3	-29 51.3													
			31	Gacrux	172 49.8	-56 51.9	72	16 31	20 23	16 40	16 14	15 54	15 35						
			29	Gienah	176 37.2	-17 17.7	70	16 39	20 07	16 18	16 03	15 50	15 38						
			35	Hadar	149 50.0	-60 09.7	68	16 46	19 54	16 00	15 54	15 47	15 41						
			6	Hamal	328 49.3	+23 15.4	66	16 52	19 44	15 47	15 46	15 44	15 43						
			48	Kaus Aust.	84 41.2	-34 24.5	64	16 57	19 36	15 35	15 39	15 42	15 45						
							62	17 01	19 29	15 25	15 34	15 40	15 46						
			40	Kochab	137 19.0	+74 20.3	60	17 05	19 24	15 16	15 28	15 38	15 47						
			57	Markab	14 21.1	+14 58.3	58	17 08	19 19	15 09	15 24	15 37	15 49						
			8	Menkar	315 00.0	+ 3 55.2	56	17 11	19 15	15 02	15 20	15 35	15 50						
			36	Menkent	148 59.0	-36 09.2	54	17 14	19 12	14 56	15 16	15 34	15 51						
			24	Miapl'dus	221 49.5	-69 31.9	52	17 17	19 09	14 51	15 13	15 33	15 52						
							50	17 19	19 06	14 46	15 10	15 32	15 52						
			9	Mirfak	309 41.9	+49 42.3	45	17 24	19 01	14 35	15 04	15 29	15 54						
			50	Nunki	76 51.9	-26 21.2	40	17 28	18 58	14 26	14 58	15 28	15 56						
			52	Peacock	54 27.1	-56 52.8	35	17 31	18 55	14 18	14 53	15 26	15 57						
			21	Pollux	244 20.6	+28 08.0	30	17 35	18 54	14 12	14 49	15 24	15 58						
			20	Procyon	245 45.0	+ 5 20.4	20	17 40	18 53	14 00	14 42	15 22	16 00						
							10	17 45	18 55	13 49	14 35	15 19	16 02						
			46	R'althague	96 46.7	+12 35.6	0	17 50	18 59	13 39	14 29	15 17	16 03						
			26	Regulus	208 29.7	+12 11.0	10	17 55	19 06	13 29	14 23	15 15	16 05						
			11	Rigel	281 53.4	- 8 14.9	20	18 01	19 16	13 19	14 16	15 12	16 07						
			38	Rigil Kent.	140 51.6	-60 39.4	30	18 07	19 29	13 07	14 09	15 09	16 09						
			44	Sabik	103 02.3	-15 40.3	35	18 11	19 38	12 59	14 04	15 08	16 10						
							40	18 15	19 50	12 51	13 59	15 06	16 11						
			3	Schedar	350 29.4	+56 17.9	45	18 20	20 04	12 42	13 53	15 04	16 12						
			45	Shaula	97 20.8	-37 04.5	50	18 26	20 24	12 30	13 46	15 01	16 14						
			18	Sirius	259 11.8	-16 39.1	52	18 28	20 33	12 25	13 43	15 00	16 15						
			33	Spica	159 17.2	-10 55.8	54	18 31	20 44	12 19	13 39	14 58	16 16						
			23	Suhail	223 24.5	-43 15.0	56	18 35	20 58	12 12	13 35	14 57	16 17						
							58	18 38	21 13	12 04	13 31	14 55	16 18						
			49	Vega	81 08.3	+38 44.8	60	18 43	21 34	11 56	13 26	14 53	16 19						
			39	Zub'g'bi	137 53.6	-15 51.5	S												
			G M T	Equation of Time (App. Mean)				GMT of Transit Meridian of Greenwich											
				10	11	12													
			h m s	m s	m s	m s	DAY	Moon	Venus	Mars	Jupiter	Saturn	Subtract from table, back cover						
			0	+12 40.4	+12 56.5	+13 12.1													
			6	+12 44.5	+13 00.5	+13 16.0	10	7 27	12 28	10 42	8 37	13 57							
			12	+12 48.5	+13 04.4	+13 19.8	11	8 18	12 28	10 40	8 34	13 53							
			18	+12 52.5	+13 08.3	+13 23.5	12	9 06	12 29	10 38	8 30	13 50							
			24	+12 56.5	+13 12.1	+13 27.3	13	9 52	12 30	10 37	8 27	13 46							
24	183 21.9	- 7 23.8																	

G M T	T GHA	VENUS -3.4		MARS 2.0		JUPITER -1.5		SATURN 0.8		MOON			
		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
13 0	20 46.9	172 38.1	-10 45.4	200 38.6	+1 04.7	232 58.9	+13 45.9	152 54.3	-15 45.5	216 32.0	129 +	1 14.3	-130
1 1	35 49.3	187 37.6	46.6	215 39.6	04.1	248 01.0	45.8	167 56.5	45.5	231 03.9	130	1 01.3	-129
2 2	50 51.8	202 37.1	47.8	230 40.6	03.4	263 03.0	45.6	182 58.7	45.6	245 35.9	129	0 48.4	-130
3 3	65 54.3	217 36.6	48.9	245 41.6	02.8	278 05.1	45.5	198 00.9	45.7	260 07.8	130	0 35.4	-129
4 4	80 56.7	232 36.2	50.1	260 42.6	02.1	293 07.1	45.3	213 03.1	45.8	274 39.8	130	0 22.5	-130
5 5	95 59.2	247 35.7	51.3	275 43.6	01.5	308 09.2	45.2	228 05.3	45.8	289 11.8	130	+ 0 09.5	-129
6 6	111 01.7	262 35.2	-10 52.5	290 44.6	+1 00.8	323 11.3	+13 45.1	243 07.5	-15 45.9	303 43.8	130	- 0 03.4	-129
7 7	126 04.1	277 34.7	53.6	305 45.6	1 00.2	338 13.3	44.9	258 09.6	46.0	318 15.8	131	0 16.3	-130
8 8	141 06.6	292 34.3	54.8	320 46.6	0 59.6	353 15.4	44.8	273 11.8	46.1	332 47.9	130	0 29.3	-129
9 9	156 09.1	307 33.8	56.0	335 47.6	58.9	8 17.4	44.7	288 14.0	46.2	347 19.9	131	0 42.2	-129
10 10	171 11.5	322 33.3	57.1	350 48.6	58.3	23 19.5	44.5	303 16.2	46.2	1 52.0	131	0 55.1	-128
11 11	186 14.0	337 32.8	58.3	5 49.6	57.6	38 21.5	44.4	318 18.4	46.3	16 24.1	132	1 07.9	-129
12 12	201 16.4	352 32.3	-10 59.5	20 50.6	+ 0 57.0	53 23.6	+13 44.3	333 20.6	-15 46.4	30 56.3	131	- 1 20.8	-129
13 13	216 18.9	7 31.9	11 00.6	35 51.6	56.3	68 25.6	44.1	348 22.8	46.5	45 28.4	131	1 33.7	-128
14 14	231 21.4	22 31.4	01.8	50 52.6	55.7	83 27.7	44.0	3 25.0	46.5	60 00.5	132	1 46.5	-128
15 15	246 23.8	37 30.9	03.0	65 53.6	55.1	98 29.8	43.9	18 27.2	46.6	74 32.7	132	1 59.3	-128
16 16	261 26.3	52 30.4	04.1	80 54.6	54.4	113 31.8	43.7	33 29.4	46.7	89 04.9	131	2 12.1	-128
17 17	276 28.8	67 29.9	05.3	95 55.6	53.8	128 33.9	43.6	48 31.6	46.8	103 37.0	132	2 24.9	-128
18 18	291 31.2	82 29.4	-11 06.5	110 56.6	+ 0 53.1	143 35.9	+13 43.5	63 33.8	-15 46.9	118 09.2	132	- 2 37.7	-127
19 19	306 33.7	97 29.0	07.6	125 57.6	52.5	158 38.0	43.3	78 36.0	46.9	132 41.4	132	2 50.4	-127
20 20	321 36.2	112 28.5	08.8	140 58.6	51.8	173 40.0	43.2	93 38.2	47.0	147 13.6	133	3 03.1	-127
21 21	336 38.6	127 28.0	10.0	155 59.6	51.2	188 42.1	43.1	108 40.4	47.1	161 45.9	132	3 15.8	-127
22 22	351 41.1	142 27.5	11.1	171 00.6	50.5	203 44.1	42.9	123 42.6	47.2	176 18.1	132	3 28.5	-126
23 23	6 43.5	157 27.0	12.3	186 01.6	49.9	218 46.2	42.8	138 44.8	47.2	190 50.3	132	3 41.1	-127
14 0	21 46.0	172 26.5	-11 13.5	201 02.6	+ 0 49.3	233 48.3	+13 42.7	153 47.0	-15 47.3	205 22.5	133	- 3 53.8	-126
1 1	36 48.5	187 26.0	14.6	216 03.6	48.6	248 50.3	42.5	168 49.1	47.4	219 54.8	132	4 06.4	-125
2 2	51 50.9	202 25.6	15.8	231 04.6	48.0	263 52.4	42.4	183 51.3	47.4	234 27.0	133	4 18.9	-126
3 3	66 53.4	217 25.1	16.9	246 05.6	47.3	278 54.4	42.3	198 53.5	47.6	248 59.3	132	4 31.5	-125
4 4	81 55.9	232 24.6	18.1	261 06.6	46.7	293 56.5	42.1	213 55.7	47.6	263 31.5	133	4 44.0	-125
5 5	96 58.3	247 24.1	19.3	276 07.6	46.0	308 58.6	42.0	228 57.9	47.7	278 03.8	132	4 56.5	-124
6 6	112 00.8	262 23.6	-11 20.4	291 08.6	+ 0 45.4	324 00.6	+13 41.9	244 00.1	-15 47.8	292 36.0	133	- 5 08.9	-124
7 7	127 03.3	277 23.1	21.6	306 09.5	44.7	339 02.7	41.7	259 02.3	47.9	307 08.3	133	5 21.3	-124
8 8	142 05.7	292 22.6	22.7	321 10.5	44.1	354 04.7	41.6	274 04.5	47.9	321 40.6	132	5 33.7	-123
9 9	157 08.2	307 22.1	23.9	336 11.5	43.5	9 06.8	41.5	289 06.7	48.0	336 12.8	133	5 46.0	-124
10 10	172 10.7	322 21.6	25.1	351 12.5	42.8	24 08.8	41.3	304 08.9	48.1	350 45.1	132	5 58.4	-122
11 11	187 13.1	337 21.2	26.2	6 13.5	42.2	39 10.9	41.2	319 11.1	48.2	5 17.3	133	6 10.6	-123
12 12	202 15.6	352 20.7	-11 27.4	21 14.5	+ 0 41.5	54 13.0	+13 41.1	334 13.3	-15 48.2	19 49.6	132	- 6 22.9	-122
13 13	217 18.0	7 20.2	28.5	36 15.5	40.9	69 15.0	40.9	349 15.5	48.3	34 21.8	133	6 35.1	-121
14 14	232 20.5	22 19.7	29.7	51 16.5	40.2	84 17.1	40.8	4 17.7	48.4	48 54.1	132	6 47.2	-121
15 15	247 23.0	37 19.2	30.8	66 17.5	39.6	99 19.1	40.7	19 19.8	48.5	63 26.3	132	6 59.3	-121
16 16	262 25.4	52 18.7	32.0	81 18.5	38.9	114 21.2	40.5	34 22.0	48.6	77 58.5	133	7 11.4	-121
17 17	277 27.9	67 18.2	33.2	96 19.5	38.3	129 23.3	40.4	49 24.2	48.6	92 30.8	132	7 23.5	-120
18 18	292 30.4	82 17.7	-11 34.3	111 20.5	+ 0 37.7	144 25.3	+13 40.3	64 26.4	-15 48.7	107 03.0	132	- 7 35.5	-119
19 19	307 32.8	97 17.2	35.5	126 21.5	37.0	159 27.4	40.1	79 28.6	48.8	121 35.2	132	7 47.4	-119
20 20	322 35.3	112 16.7	36.6	141 22.5	36.4	174 29.4	40.0	94 30.8	48.9	136 07.4	132	7 59.3	-119
21 21	337 37.8	127 16.2	37.8	156 23.5	35.7	189 31.5	39.9	109 33.0	48.9	150 39.6	132	8 11.2	-118
22 22	352 40.2	142 15.7	38.9	171 24.5	35.1	204 33.6	39.7	124 35.2	49.0	165 11.8	132	8 23.0	-118
23 23	7 42.7	157 15.2	40.1	186 25.5	34.4	219 35.6	39.6	139 37.4	49.1	179 44.0	132	8 34.8	-117
15 0	22 45.2	172 14.7	-11 41.2	201 26.5	+ 0 33.8	234 37.7	+13 39.5	154 39.6	-15 49.2	194 16.2	131	- 8 46.5	-117
1 1	37 47.6	187 14.3	42.4	216 27.5	33.1	249 39.8	39.3	169 41.8	49.3	208 48.3	132	8 58.2	-116
2 2	52 50.1	202 13.8	43.5	231 28.5	32.5	264 41.8	39.2	184 44.0	49.3	223 20.5	131	9 09.8	-115
3 3	67 52.5	217 13.3	44.7	246 29.5	31.9	279 43.9	39.1	199 46.2	49.4	237 52.6	132	9 21.3	-116
4 4	82 55.0	232 12.8	45.8	261 30.5	31.2	294 45.9	38.9	214 48.4	49.5	252 24.8	131	9 32.9	-114
5 5	97 57.5	247 12.3	47.0	276 31.5	30.6	309 48.0	38.8	229 50.5	49.6	266 56.9	131	9 44.3	-114
6 6	112 59.9	262 11.8	-11 48.1	291 32.5	+ 0 29.9	324 50.1	+13 38.7	244 52.7	-15 49.6	281 29.0	131	- 9 55.7	-114
7 7	128 02.4	277 11.3	49.3	306 33.5	29.3	339 52.1	38.5	259 54.9	49.7	296 01.1	130	10 07.1	-113
8 8	143 04.9	292 10.8	50.4	321 34.5	28.6	354 54.2	38.4	274 57.1	49.8	310 33.1	131	10 18.4	-112
9 9	158 07.3	307 10.3	51.6	336 35.5	28.0	9 56.3	38.3	289 59.3	49.9	325 05.2	130	10 29.6	-112
10 10	173 09.8	322 09.8	52.7	351 36.5	27.4	24 58.3	38.1	305 01.5	50.0	339 37.2	131	10 40.8	-112
11 11	188 12.3	337 09.3	53.9	6 37.5	26.7	40 00.4	38.0	320 03.7	50.0	354 09.3	130	10 52.0	-110
12 12	203 14.7	352 08.8	-11 55.0	21 38.5	+ 0 26.1	55 02.4	+13 37.9	335 05.9	-15 50.1	8 41.3	130	-11 03.0	-111
13 13	218 17.2	7 08.3	56.1	36 39.5	25.4	70 04.5	37.7	350 08.1	50.2	23 13.3	130	11 14.1	-109
14 14	233 19.6	22 07.8	57.3	51 40.5	24.8	85 06.6	37.6	5 10.3	50.3	37 45.3	129	11 25.0	-109
15 15	248 22.1	37 07.3	58.4	66 41.5	24.1	100 08.6	37.5	20 12.5	50.3	52 17.2	130	11 35.9	-108
16 16	263 24.6	52 06.8	11 59.6	81 42.5	23.5	115 10.7	37.3	35 14.6	50.4	66 49.2	129	11 46.7	-108
17 17	278 27.0	67 06.3	12 00.7	96 43.5	22.8	130 12.8	37.2	50 16.8	50.5	81 21.1	129	11 57.5	-107
18 18	293 29.5	82 05.8	-12 01.9	111 44.5	+ 0 22.2	145 14.8	+13 37.1	65 19.0	-15 50.6	95 53.0	129	-12 08.2	-107
19 19	308 32.0	97 05.3	03.0	126 45.5	21.6	160 16.9	37.0	80 21.2	50.7	110 24.9	129	12 18.9	-105
20 20	323 34.4	112 04.8	04.2	141 46.5	20.9	175 19.0	36.8	95 23.4	50.7	124 56.8	128	12 29.4	-106
21 21	338 36.9	127 04.2	05.3	156 47.5	20.3	190 21.0	36.7	110 25.6	50.8	139 28.6	129	12 40.0	-104
22 22	353 39.4	142 03.7	06.4	171 48.5	19.6	205 23.1	36.6	125 27.8	50.9	154 00.5	128	12 50.4	-104
23 23	8 41.8	157 03.2	07.6	186 49.5	19.0	220 25.2	36.4	140 30.0	51.0	168 32.3	128	13 00.8	-103
24 24	23 44.3	172 02.7	-12 08.7	201 50.5	+ 0 18.3	235 27.2	+13 36.3	155 32.2	-15 51.0	183 04.1	128	-13 11.1	-102
code	-	- 5	- 11	+ 10	- 6	+ 20	- 2	+ 22	- 1				

G M T	T	VENUS -3.4		MARS 2.0		JUPITER -1.5		SATURN 0.8		MOON			
		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
16	h	o	°	°	°	°	°	°	°	°	°	°	°
0	0	23 44.3	172 02.7	-12 08.7	201 50.5	+ 0 18.3	235 27.2	+13 36.3	155 32.2	-15 51.0	183 04.1	128 -13 11.1	-102
1	1	38 46.8	187 02.2	09.9	216 51.5	17.7	250 29.3	36.2	170 34.4	51.1	197 35.9	127 13 21.3	-102
2	2	53 49.2	202 01.7	11.0	231 52.5	17.0	265 31.3	36.0	185 36.6	51.2	212 07.6	128 13 31.5	-101
3	3	68 51.7	217 01.2	12.1	246 53.5	16.4	280 33.4	35.9	200 38.7	51.3	226 39.4	127 13 41.6	-100
4	4	83 54.1	232 00.7	13.3	261 54.5	15.8	295 35.5	35.8	215 40.9	51.4	241 11.1	127 13 51.6	-100
5	5	98 56.6	247 00.2	14.4	276 55.5	15.1	310 37.5	35.6	230 43.1	51.4	255 42.8	126 14 01.6	-99
6	6	113 59.1	261 59.7	-12 15.5	291 56.5	+ 0 14.5	325 39.6	+13 35.5	245 45.3	-15 51.5	270 14.4	127 -14 11.5	-98
7	7	129 01.5	276 59.2	16.7	306 57.5	13.8	340 41.7	35.4	260 47.5	51.6	284 46.1	126 14 21.3	-98
8	8	144 04.0	291 58.7	17.8	321 58.5	13.2	355 43.7	35.2	275 49.7	51.7	299 17.7	126 14 31.1	-96
9	9	159 06.5	306 58.2	19.0	336 59.5	12.5	10 45.8	35.1	290 51.9	51.7	313 49.3	126 14 40.7	-96
10	10	174 08.9	321 57.7	20.1	352 00.5	11.9	25 47.9	35.0	305 54.1	51.8	328 20.9	125 14 50.3	-95
11	11	189 11.4	336 57.2	21.2	7 01.5	11.2	40 50.0	34.9	320 56.3	51.9	342 52.4	126 14 59.8	-95
12	12	204 13.9	351 56.6	-12 22.4	22 02.5	+ 0 10.6	55 52.0	+13 34.7	335 58.5	-15 52.0	357 24.0	125 -15 09.3	-93
13	13	219 16.3	6 56.1	23.5	37 03.5	10.0	70 54.1	34.6	351 00.6	52.0	11 55.5	125 15 18.6	-93
14	14	234 18.8	21 55.6	24.6	52 04.5	09.3	85 56.2	34.5	6 02.8	52.1	26 27.0	124 15 27.9	-92
15	15	249 21.2	36 55.1	25.8	67 05.4	08.7	100 58.2	34.3	21 05.0	52.2	40 58.4	125 15 37.1	-91
16	16	264 23.7	51 54.6	26.9	82 06.4	08.0	116 00.3	34.2	36 07.2	52.3	55 29.9	124 15 46.2	-91
17	17	279 26.2	66 54.1	28.0	97 07.4	07.4	131 02.4	34.1	51 09.4	52.4	70 01.3	124 15 55.3	-89
18	18	294 28.6	81 53.6	-12 29.1	112 08.4	+ 0 06.1	146 04.4	+13 33.9	66 11.6	-15 52.4	84 32.7	123 -16 04.2	-89
19	19	309 31.1	96 53.1	30.3	127 09.4	06.1	161 06.5	33.8	81 13.8	52.5	99 04.0	124 16 13.1	-88
20	20	324 33.6	111 52.5	31.4	142 10.4	05.4	176 08.6	33.7	96 16.0	52.6	113 35.4	123 16 21.9	-87
21	21	339 36.0	126 52.0	32.5	157 11.4	04.8	191 10.6	33.5	111 18.2	52.7	128 06.7	123 16 30.6	-87
22	22	354 38.5	141 51.5	33.7	172 12.4	04.2	206 12.7	33.4	126 20.3	52.7	142 38.0	122 16 39.3	-85
23	23	9 41.0	156 51.0	34.8	187 13.4	03.5	221 14.8	33.3	141 22.5	52.8	157 09.2	123 16 47.8	-85
17	0	24 43.4	171 50.5	-12 35.9	202 14.4	+ 0 02.9	236 16.8	+13 33.2	156 24.7	-15 52.9	171 40.5	122 -16 56.3	-83
1	1	39 45.9	186 50.0	37.0	217 15.4	02.2	251 18.9	33.0	171 26.9	53.0	186 11.7	122 17 04.6	-83
2	2	54 48.4	201 49.4	38.2	232 16.4	01.6	266 21.0	32.9	186 29.1	53.1	200 42.9	122 17 12.9	-82
3	3	69 50.8	216 48.9	39.3	247 17.4	00.9	281 23.1	32.8	201 31.3	53.1	215 14.1	121 17 21.1	-82
4	4	84 53.3	231 48.4	40.4	262 18.4	+ 0 00.3	296 25.1	32.6	216 33.5	53.2	229 45.2	122 17 29.3	-80
5	5	99 55.7	246 47.9	41.6	277 19.4	- 0 00.4	311 27.2	32.5	231 35.7	53.3	244 16.4	121 17 37.3	-79
6	6	114 58.2	261 47.4	-12 42.7	292 20.4	- 0 01.0	326 29.3	+13 32.4	246 37.9	-15 53.4	258 47.5	120 -17 45.2	-79
7	7	130 00.7	276 46.9	43.8	307 21.4	01.6	341 31.3	32.2	261 40.0	53.4	273 18.5	121 17 53.1	-77
8	8	145 03.1	291 46.3	44.9	322 22.4	02.3	356 33.4	32.1	276 42.2	53.5	287 49.6	120 18 00.8	-77
9	9	160 05.6	306 45.8	46.0	337 23.4	02.9	11 35.5	32.0	291 44.4	53.6	302 20.6	120 18 08.5	-76
10	10	175 08.1	321 45.3	47.2	352 24.4	03.6	26 37.6	31.9	306 46.6	53.7	316 51.6	120 18 16.1	-75
11	11	190 10.5	336 44.8	48.3	7 25.4	04.2	41 39.6	31.7	321 48.8	53.8	331 22.6	120 18 23.6	-74
12	12	205 13.0	351 44.3	-12 49.4	22 26.4	- 0 04.9	56 41.7	+13 31.6	336 51.0	-15 53.8	345 53.6	119 -18 31.0	-73
13	13	220 15.5	6 43.7	50.5	37 27.4	05.5	71 43.8	31.5	351 53.2	53.9	0 24.5	119 18 38.3	-72
14	14	235 17.9	21 43.2	51.7	52 28.4	06.2	86 45.8	31.3	6 55.4	54.0	14 55.4	119 18 45.5	-71
15	15	250 20.4	36 42.7	52.8	67 29.4	06.8	101 47.9	31.2	21 57.6	54.1	29 26.3	119 18 52.6	-70
16	16	265 22.8	51 42.2	53.9	82 30.4	07.4	116 50.0	31.1	36 59.7	54.1	43 57.2	118 18 59.6	-70
17	17	280 25.3	66 41.6	55.0	97 31.4	08.1	131 52.1	31.0	52 01.9	54.2	58 28.0	118 19 06.6	-68
18	18	295 27.8	81 41.1	-12 56.1	112 32.4	- 0 08.7	146 54.1	+13 30.8	67 04.1	-15 54.3	72 58.8	118 -19 13.4	-67
19	19	310 30.2	96 40.6	57.2	127 33.4	09.4	161 56.2	30.7	82 06.3	54.4	87 29.6	118 19 20.1	-67
20	20	325 32.7	111 40.1	58.4	142 34.4	10.0	176 58.3	30.6	97 08.5	54.5	102 00.4	118 19 26.8	-65
21	21	340 35.2	126 39.6	12 59.5	157 35.4	10.7	192 00.4	30.4	112 10.7	54.5	116 31.2	117 19 33.3	-65
22	22	355 37.6	141 39.0	13 00.6	172 36.4	11.3	207 02.4	30.3	127 12.9	54.6	131 01.9	117 19 39.8	-63
23	23	10 40.1	156 38.5	01.7	187 37.4	12.0	222 04.5	30.2	142 15.1	54.7	145 32.6	117 19 46.1	-63
18	0	25 42.6	171 38.0	-13 02.8	202 38.4	- 0 12.6	237 06.6	+13 30.1	157 17.2	-15 54.8	160 03.3	117 -19 52.4	-61
1	1	40 45.0	186 37.4	03.9	217 39.4	13.2	252 08.7	29.9	172 19.4	54.9	174 34.0	116 19 58.5	-61
2	2	55 47.5	201 36.9	05.1	232 40.4	13.9	267 10.7	29.8	187 21.6	54.9	189 04.6	117 20 04.6	-59
3	3	70 50.0	216 36.4	06.2	247 41.4	14.5	282 12.8	29.7	202 23.8	55.0	203 35.3	116 20 10.5	-59
4	4	85 52.4	231 35.9	07.3	262 42.4	15.2	297 14.9	29.5	217 26.0	55.1	218 05.9	116 20 16.4	-58
5	5	100 54.9	246 35.3	08.4	277 43.4	15.8	312 17.0	29.4	232 28.2	55.2	232 36.5	115 20 22.2	-56
6	6	115 57.3	261 34.8	-13 09.5	292 44.4	- 0 16.5	327 19.0	+13 29.3	247 30.4	-15 55.2	247 07.0	116 -20 27.8	-56
7	7	130 59.8	276 34.3	10.6	307 45.4	17.1	342 21.1	29.2	262 32.6	55.3	261 37.6	115 20 33.4	-54
8	8	146 02.3	291 33.8	11.7	322 46.4	17.8	357 23.2	29.0	277 34.7	55.4	276 08.1	115 20 38.8	-54
9	9	161 04.7	306 33.2	12.8	337 47.3	18.4	12 25.3	28.9	292 36.9	55.5	290 38.6	115 20 44.2	-52
10	10	176 07.2	321 32.7	13.9	352 48.3	19.0	27 27.3	28.8	307 39.1	55.6	305 09.1	115 20 49.4	-52
11	11	191 09.7	336 32.2	15.1	7 49.3	19.7	42 29.4	28.6	322 41.3	55.6	319 39.6	115 20 54.6	-50
12	12	206 12.1	351 31.6	-13 16.2	22 50.3	- 0 20.3	57 31.5	+13 28.5	337 43.5	-15 55.7	334 10.1	114 -20 59.6	-50
13	13	221 14.6	6 31.1	17.3	37 51.3	21.0	72 33.6	28.4	352 45.7	55.8	348 40.5	115 21 04.6	-48
14	14	236 17.1	21 30.6	18.4	52 52.3	21.6	87 35.6	28.3	7 47.9	55.9	3 11.0	114 21 09.4	-47
15	15	251 19.5	36 30.0	19.5	67 53.3	22.3	102 37.7	28.1	22 50.0	55.9	17 41.4	114 21 14.1	-47
16	16	266 22.0	51 29.5	20.6	82 54.3	22.9	117 39.8	28.0	37 52.2	56.0	32 11.8	114 21 18.8	-45
17	17	281 24.5	66 29.0	21.7	97 55.3	23.6	132 41.9	27.9	52 54.4	56.1	46 42.2	114 21 23.3	-44
18	18	296 26.9	81 28.4	-13 22.8	112 56.3	- 0 24.2	147 43.9	+13 27.7	67 56.6	-15 56.2	61 12.6	113 -21 27.7	-43
19	19	311 29.4	96 27.9	23.9	127 57.3	24.8	162 46.0	27.6	82 58.8	56.3	75 42.9	114 21 32.0	-43
20	20	326 31.8	111 27.4	25.0	142 58.3	25.5	177 48.1	27.5	98 01.0	56.3	90 13.3	113 21 36.3	-41
21	21	341 34.3	126 26.8	26.1	157 59.3	26.1	192 50.2	27.4	113 03.2	56.4	104 43.6	113 21 40.4	-40
22	22	356 36.8	141 26.3	27.2	173 00.3	26.8	207 52.3	27.2	128 05.3	56.5	119 13.9	114 21 44.4	-39
23	23	11 39.2	156 25.8	28.3	188 01.3	27.4	222 54.3	27.1	143 07.5	56.6	133 44.3	113 21 48.3	-38
24	24	26 41.7	171 25.2	-13 29.4	203 02.3	- 0 28.1	237 56.4	+13 27.0	158 09.7	-15 56.6	148 14.6	112 -21 52.1	-36
code		-	- 6	- 11	+ 10	- 6	+ 21	- 1	+ 22	- 1			

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS						
	GHA	Dec.	No.	Name	SHA	Dec.				16	17	18	19	Moon's Lower Limb						
														Add						
h	°	'	°	'	°	'	N	h	m	h	m	h	m	h	m	Alt.	Sun's Low'r Limb Add	Venus Add	Mars Add	
16	0	183 32.4	- 8 31.0	7	Acamar	315 50.7	-40 28.6	72	7 30	3 35	9 46	■	■	■	■	0	'	'	'	
	1	198 32.6	31.9	5	Achernar	335 58.2	-57 27.5	70	7 18	3 48	9 12	11 24	■	■	■	30	0.4	0.1	0.1	
	2	213 32.7	32.8	30	Acrux	173 58.4	-62 51.2	68	7 08	3 58	8 47	10 37	12 37	■	■	45	0.4	0.1	0.0	
	3	228 32.8	33.7	19	Adhara	255 46.4	-28 54.4	66	7 00	4 05	8 28	10 06	11 42	13 11	■	60	0.4	0.0	0.0	
	4	243 33.0	34.7	10	Aldebaran	291 38.8	+16 25.4	64	6 53	4 11	8 13	9 43	11 10	12 26	■	75	0.4	0.0	0.0	
	5	258 33.1	35.6					62	6 48	4 17	8 01	9 25	10 46	11 57	■	90				
	6	273 33.2	- 8 36.5	32	Alioth	166 59.0	+56 11.9	60	6 42	4 21	7 50	9 11	10 27	11 34	■					
	7	288 33.4	37.4	34	Alkaid	153 33.3	+49 32.0	58	6 38	4 25	7 41	8 58	10 11	11 16	■					
	8	303 33.5	38.4	55	Al Na'ir	28 37.6	-47 10.6	56	6 34	4 28	7 33	8 47	9 57	11 01	■					
	9	318 33.7	39.3	15	Anilam	276 30.1	- 1 13.6	54	6 30	4 30	7 26	8 38	9 46	10 48	■					
	10	333 33.8	40.2	25	Alphard	218 38.7	- 8 27.9	52	6 27	4 33	7 19	8 29	9 36	10 36	■					
	11	348 33.9	41.1					50	6 24	4 35	7 13	8 22	9 27	10 26	■					
	12	3 34.1	- 8 42.1	41	Alphecca	126 47.9	+26 51.9	45	6 17	4 38	7 01	8 06	9 07	10 05	■	Moon's Lower Limb				
	13	18 34.2	43.0	1	Alpheratz	358 28.0	+28 51.1	40	6 12	4 41	6 51	7 52	8 52	9 48	■	Add				
	14	33 34.3	43.9	51	Altair	62 50.4	+ 8 45.3	35	6 07	4 42	6 42	7 41	8 39	9 34	■	Alt.	16	17	18	
	15	48 34.5	44.8	2	Ankaa	353 57.8	-42 32.6	30	6 03	4 42	6 35	7 31	8 27	9 21	■	0	'	'	'	
	16	63 34.6	45.8	42	Antares	113 19.6	-26 20.1	20	5 55	4 41	6 21	7 15	8 08	9 00	■	4	13.6	13.1	12.6	
	17	78 34.7	46.7					10	5 49	4 39	6 10	7 00	7 51	8 41	■	8	13.7	13.1	12.6	
	18	93 34.9	- 8 47.6	37	Arcturus	146 35.5	+19 24.8	0	5 42	4 32	6 00	6 47	7 35	8 24	■	12	13.7	13.2	12.7	
	19	108 35.0	48.5	43	Atria	109 00.6	-68 57.2	10	5 36	4 25	5 49	6 33	7 19	8 07	■	16	13.7	13.2	12.7	
	20	123 35.1	49.4	22	Avior	234 35.9	-59 21.7	20	5 29	4 15	5 38	6 19	7 03	7 49	■	20	13.7	13.2	12.7	
	21	138 35.3	50.4	13	Bellatrix	279 18.2	+ 6 18.8	30	5 21	3 59	5 25	6 03	6 44	7 28	■	24	13.8	13.3	12.8	
	22	153 35.4	51.3	16	Betel'ge	271 47.9	+ 7 24.1	35	5 16	3 49	5 18	5 53	6 32	7 15	■	28	13.8	13.3	12.9	
	23	168 35.5	52.2					40	5 11	3 36	5 10	5 43	6 20	7 01	■	32	13.8	13.4	12.9	
17	0	183 35.7	- 8 53.1	17	Canopus	264 15.2	-52 40.0	45	5 04	3 20	5 00	5 30	6 05	6 44	■	36	13.9	13.5	13.0	
	1	198 35.8	54.1	12	Capella	281 38.1	+45 57.2	50	4 57	2 58	4 48	5 15	5 46	6 24	■	40	14.0	13.5	13.1	
	2	213 35.9	55.0	53	Deneb	50 00.9	+45 07.7	52	4 53	2 47	4 43	5 08	5 38	6 14	■	44	14.0	13.6	13.2	
	3	228 36.1	55.9	28	Denebola	183 18.0	+14 49.1	54	4 49	2 34	4 37	5 00	5 28	6 03	■	48	14.1	13.7	13.3	
	4	243 36.2	56.8	4	Diphda	349 38.9	-18 13.5	56	4 45	2 18	4 31	4 51	5 17	5 51	■	52	14.2	13.8	13.4	
	5	258 36.3	57.7					58	4 40	1 59	4 23	4 41	5 05	5 36	■	56	14.3	13.9	13.6	
	6	273 36.5	- 8 58.7	27	Dubhe	194 45.0	+61 59.2	60	4 35	1 33	4 15	4 30	4 50	5 19	■	60	14.3	14.0	13.7	
	7	288 36.6	8 59.6	14	Elnath	279 07.1	+28 34.3	Lat.		Sunset	Twlt. ends	Moonset				Moon's Upper Limb				
	8	303 36.7	9 00.5	47	Eltanin	91 06.5	+51 29.9	N	h	m	h	m	h	m	h	m	h	m	h	m
	9	318 36.8	01.4	54	Enif	34 29.4	+ 9 40.6													
	10	333 37.0	02.3	56	Fomalhaut	16 11.3	-29 51.3	72	15 59	19 49	14 17	■	■	■	76	14.7	14.5	14.3		
	11	348 37.1	03.2					70	16 11	19 37	14 53	14 20	■	■	80	14.8	14.6	14.4		
	12	3 37.2	- 9 04.2	31	Gacrux	172 49.8	-56 51.9	68	16 21	19 28	15 19	15 09	14 49	■	84	14.9	14.8	14.6		
	13	18 37.4	05.1	29	Gienah	176 37.1	-17 17.7	66	16 29	19 21	15 39	15 40	15 44	15 58	■	88	15.0	14.9	14.8	
	14	33 37.5	06.0	6	Hamal	328 49.3	+23 15.4	64	16 36	19 15	15 55	16 03	16 18	16 43	■	90	15.1	15.0	14.9	
	15	48 37.6	06.9	48	Kaus Aust.	84 41.3	-34 24.5	62	16 42	19 10	16 09	16 22	16 42	17 13	■	Add to table, back cover				
	16	63 37.7	07.8					60	16 48	19 07	16 20	16 37	17 01	17 35	■	Moon's Upper Limb				
	17	78 37.9	08.8	50	Kochab	137 19.0	+74 20.2	58	16 52	19 03	16 30	16 50	17 17	17 54	■	Subtract				
	18	93 38.0	- 9 09.7	8	Markab	14 21.2	+14 58.3	56	16 56	19 00	16 39	17 02	17 31	18 09	■	Alt.	16	17	18	
	19	108 38.1	10.6	57	Menkar	315 00.0	+ 3 55.2	54	17 00	18 58	16 46	17 12	17 43	18 22	■	0	'	'	'	
	20	123 38.3	11.5	36	Menkent	148 59.0	-36 09.2	52	17 03	18 55	16 53	17 21	17 53	18 34	■	4	16.6	16.9	17.2	
	21	138 38.4	12.4	24	Miap'ldus	221 49.4	-69 31.9	50	17 06	18 53	17 00	17 29	18 03	18 44	■	8	16.6	16.9	17.2	
	22	153 38.5	13.3	9	Mirfak	309 41.9	+49 42.4	45	17 13	18 51	17 13	17 46	18 23	19 05	■	12	16.6	16.9	17.2	
	23	168 38.6	14.2	50	Nunki	76 51.9	-26 21.2	40	17 19	18 49	17 24	18 00	18 39	19 23	■	16	16.6	16.8	17.1	
18	0	183 38.8	- 9 15.2	52	Peacock	54 27.1	-56 52.8	35	17 24	18 48	17 34	18 11	18 52	19 37	■	20	16.5	16.8	17.1	
	1	198 38.9	16.1	21	Pollux	244 20.5	+28 08.0	30	17 28	18 48	17 43	18 22	19 04	19 50	■	24	16.5	16.7	17.0	
	2	213 39.0	17.0	20	Procyon	245 44.9	+ 5 20.4	20	17 36	18 50	17 57	18 40	19 24	20 12	■	28	16.4	16.7	16.9	
	3	228 39.1	17.9					10	17 42	18 52	18 10	18 55	19 42	20 30	■	32	16.4	16.6	16.8	
	4	243 39.3	18.8	46	R'alhague	96 46.7	+12 35.6	0	17 49	18 59	18 22	19 10	19 59	20 48	■	36	16.3	16.5	16.7	
	5	258 39.4	19.7	26	Regulus	208 29.7	+12 11.0	10	17 55	19 06	18 34	19 25	20 15	21 06	■	40	16.3	16.4	16.6	
	6	273 39.5	- 9 20.7	11	Rigel	281 53.4	- 8 14.9	20	18 03	19 18	18 47	19 40	20 33	21 24	■	44	16.2	16.4	16.5	
	7	288 39.6	21.6	38	Rigel Kent	140 51.6	-60 39.4	30	18 11	19 34	19 02	19 59	20 53	21 46	■	48	16.1	16.3	16.4	
	8	303 39.8	22.5	44	Sabik	103 02.3	-15 40.3	35	18 16	19 45	19 11	20 09	21 05	21 59	■	52	16.0	16.2	16.3	
	9	318 39.9	23.4					40	18 21	19 57	19 20	20 21	21 19	22 13	■	56	15.9	16.0	16.1	
	10	333 40.0	24.3	3	Schedar	350 29.4	+56 18.0	45	18 28	20 15	19 32	20 36	21 36	22 31	■	60	15.8	15.9	16.0	
	11	348 40.1	25.2	45	Shaula	97 20.8	-37 04.5	50	18 35	20 37	19 46	20 53	21 56	22 52	■	64	15.8	15.8	15.9	
	12	3 40.3	- 9 26.1	18	Sirius	259 11.7	-16 39.1	52	18 39	20 49	19 53	21 01	22 05	23 02	■	68	15.7	15.7	15.7	
	13	18 40.4	27.0	33	Spica	159 17.2	-10 55.8	54	18 43	21 02	20 00	21 11	22 16	23 14	■	72	15.6	15.6	15.6	
	14	33 40.5	28.0	23	Suhail	223 24.5	-43 15.0	56	18 47	21 18	20 08	21 21	22 28	23 27	■	76	15.5	15.4	15.4	
	15	48 40.6	28.9					58	18 52	21 39	20 18	21 33	22 43	23 43	■	80	15.4	15.3	15.2	
	16	63 40.7	29.8	49	Vega	81 08.4	+38 44.8	60	18 58	22 0										

G M T	T GHA	VENUS - 3.4		MARS 2.0		JUPITER - 1.5		SATURN 0.8		MOON			
		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
19	h	o	o	o	o	o	o	o	o	o	o	o	o
0	26 41.7	171 25.2	-13 29.4	203 02.3	- 0 28.1	237 56.4	+13 27.0	158 09.7	-15 56.6	148 14.6	112	-21 52.1	- 36
1	41 44.2	186 24.7	30.5	218 03.3	28.7	252 58.5	26.8	173 11.9	56.7	162 44.8	113	21 55.7	- 36
2	56 46.6	201 24.1	31.6	233 04.3	29.3	268 00.6	26.7	188 14.1	56.8	177 15.1	113	21 59.3	- 35
3	71 49.1	216 23.6	.. 32.7	248 05.3	.. 30.0	283 02.7	.. 26.6	203 16.3	.. 56.9	191 45.4	113	.. 22 02.8	- 33
4	86 51.6	231 23.1	33.8	263 06.3	30.6	298 04.7	26.5	218 18.5	57.0	206 15.7	112	22 06.1	- 33
5	101 54.0	246 22.5	34.9	278 07.3	31.3	313 06.8	26.3	233 20.6	57.0	220 45.9	113	22 09.4	- 32
6	116 56.5	261 22.0	-13 36.0	293 08.3	- 0 31.9	328 08.9	+13 26.2	248 22.8	-15 57.1	235 16.2	112	-22 12.6	- 30
7	131 58.9	276 21.4	37.1	308 09.3	32.6	343 11.0	26.1	263 25.0	57.2	249 46.4	112	22 15.6	- 29
8	147 01.4	291 20.9	38.2	323 10.3	33.2	358 13.1	26.0	278 27.2	57.3	264 16.6	112	22 18.5	- 29
9	162 03.9	306 20.4	.. 39.3	338 11.3	.. 33.9	13 15.1	.. 25.8	293 29.4	.. 57.3	278 46.8	113	.. 22 21.4	- 27
10	177 06.3	321 19.8	40.4	353 12.3	34.5	28 17.2	25.7	308 31.6	57.4	293 17.1	112	22 24.1	- 26
11	192 08.8	336 19.3	41.5	8 13.3	35.1	43 19.3	25.6	323 33.8	57.5	307 47.3	112	22 26.7	- 25
12	207 11.3	351 18.7	-13 42.6	23 14.3	- 0 35.8	58 21.4	+13 25.5	338 35.9	-15 57.6	322 17.5	112	-22 29.2	- 24
13	222 13.7	6 18.2	43.7	38 15.3	36.4	73 23.5	25.3	353 38.1	57.7	336 47.7	112	22 31.6	- 23
14	237 16.2	21 17.7	44.8	53 16.3	37.1	88 25.5	25.2	8 40.3	57.7	351 17.9	112	22 33.9	- 21
15	252 18.7	36 17.1	.. 45.9	68 17.3	.. 37.7	103 27.6	.. 25.1	23 42.5	.. 57.8	5 48.1	112	.. 22 36.0	- 21
16	267 21.1	51 16.6	47.0	83 18.3	38.4	118 29.7	24.9	38 44.7	57.9	20 18.3	112	22 38.1	- 20
17	282 23.6	66 16.0	48.1	98 19.2	39.0	133 31.8	24.8	53 46.9	58.0	34 48.5	112	22 40.1	- 18
18	297 26.1	81 15.5	-13 49.2	113 20.2	- 0 39.7	148 33.9	+13 24.7	68 49.1	-15 58.0	49 18.7	112	-22 41.9	- 17
19	312 28.5	96 14.9	50.2	128 21.2	40.3	163 36.0	24.6	83 51.2	58.1	63 48.9	112	22 43.6	- 17
20	327 31.0	111 14.4	51.3	143 22.2	40.9	178 38.0	24.4	98 53.4	58.2	78 19.1	111	22 45.3	- 15
21	342 33.4	126 13.8	.. 52.4	158 23.2	.. 41.6	193 40.1	.. 24.3	113 55.6	.. 58.3	92 49.2	112	.. 22 46.8	- 14
22	357 35.9	141 13.3	53.5	173 24.2	42.2	208 42.2	24.2	128 57.8	58.4	107 19.4	112	22 48.2	- 13
23	12 38.4	156 12.7	54.6	188 25.2	42.9	223 44.3	24.1	144 00.0	58.4	121 49.6	112	22 49.5	- 12
20	0 27 40.8	171 12.2	-13 55.7	203 26.2	- 0 43.5	238 46.4	+13 23.9	159 02.2	-15 58.5	136 19.8	112	-22 50.7	- 11
1	42 43.3	186 11.6	56.8	218 27.2	44.2	253 48.5	23.8	174 04.3	58.6	150 50.0	112	22 51.8	- 10
2	57 45.8	201 11.1	57.9	233 28.2	44.8	268 50.5	23.7	189 06.5	58.7	165 20.2	112	22 52.8	- 9
3	72 48.2	216 10.6	.. 58.9	248 29.2	.. 45.4	283 52.6	.. 23.6	204 08.7	.. 58.8	179 50.4	113	.. 22 53.7	- 7
4	87 50.7	231 10.0	14 00.0	263 30.2	46.1	298 54.7	23.4	219 10.9	58.8	194 20.7	112	22 54.4	- 7
5	102 53.2	246 09.5	01.1	278 31.2	46.7	313 56.8	23.3	234 13.1	58.9	208 50.9	112	22 55.1	- 5
6	117 55.6	261 08.9	-14 02.2	293 32.2	- 0 47.4	328 58.9	+13 23.2	249 15.3	-15 59.0	223 21.1	112	-22 55.6	- 4
7	132 58.1	276 08.3	03.3	308 33.2	48.0	344 01.0	23.1	264 17.5	59.1	237 51.3	113	22 56.0	- 4
8	148 00.6	291 07.8	04.4	323 34.2	48.7	359 03.0	22.9	279 19.6	59.1	252 21.6	112	22 56.4	- 2
9	163 03.0	306 07.2	.. 05.5	338 35.2	.. 49.3	14 05.1	.. 22.8	294 21.8	.. 59.2	266 51.8	113	.. 22 56.6	- 1
10	178 05.5	321 06.7	06.5	353 36.2	50.0	29 07.2	22.7	309 24.0	59.3	281 22.1	112	22 56.7	0
11	193 07.9	336 06.1	07.6	8 37.2	50.6	44 09.3	22.6	324 26.2	59.4	295 52.3	113	22 56.7	+ 1
12	208 10.4	351 05.6	-14 08.7	23 38.2	- 0 51.2	59 11.4	+13 22.4	339 28.4	-15 59.5	310 22.6	113	-22 56.6	+ 3
13	223 12.9	6 05.0	09.8	38 39.2	51.9	74 13.5	22.3	354 30.6	59.5	324 52.9	113	22 56.3	+ 3
14	238 15.3	21 04.5	10.9	53 40.2	52.5	89 15.6	22.2	9 32.7	59.6	339 23.2	113	22 56.0	+ 4
15	253 17.8	36 03.9	.. 11.9	68 41.2	.. 53.2	104 17.6	.. 22.1	24 34.9	.. 59.7	353 53.5	113	.. 22 55.6	+ 6
16	268 20.3	51 03.4	13.0	83 42.2	53.8	119 19.7	21.9	39 37.1	59.8	8 23.8	113	22 55.0	+ 6
17	283 22.7	66 02.8	14.1	98 43.2	54.5	134 21.8	21.8	54 39.3	59.8	22 54.1	113	22 54.4	+ 8
18	298 25.2	81 02.3	-14 15.2	113 44.2	- 0 55.1	149 23.9	+13 21.7	69 41.5	-15 59.9	37 24.4	114	-22 53.6	+ 8
19	313 27.7	96 01.7	16.2	128 45.2	55.7	164 26.0	21.6	84 43.7	16 00.0	51 54.8	113	22 52.8	+ 10
20	328 30.1	111 01.1	17.3	143 46.2	56.4	179 28.1	21.4	99 45.8	00.1	66 25.1	114	22 51.8	+ 11
21	343 32.6	126 00.6	.. 18.4	158 47.1	.. 57.0	194 30.2	.. 21.3	114 48.0	.. 00.2	80 55.5	114	.. 22 50.7	+ 12
22	358 35.1	141 00.0	19.5	173 48.1	57.7	209 32.2	21.2	129 50.2	00.2	95 25.9	114	22 49.5	+ 13
23	13 37.5	155 59.5	20.5	188 49.1	58.3	224 34.3	21.1	144 52.4	00.3	109 56.3	114	22 48.2	+ 14
21	0 28 40.0	170 58.9	-14 21.6	203 50.1	- 0 59.0	239 36.4	+13 20.9	159 54.6	-16 00.4	124 26.7	115	-22 46.8	+ 15
1	43 42.4	185 58.4	22.7	218 51.1	0 59.6	254 38.5	20.8	174 56.8	00.5	138 57.2	114	22 45.3	+ 16
2	58 44.9	200 57.8	23.8	233 52.1	1 00.3	269 40.6	20.7	189 58.9	00.5	153 27.6	115	22 43.7	+ 17
3	73 47.4	215 57.2	.. 24.8	248 53.1	.. 00.9	284 42.7	.. 20.6	205 01.1	.. 00.6	167 58.1	115	.. 22 42.0	+ 18
4	88 49.8	230 56.7	25.9	263 54.1	01.5	299 44.8	20.4	220 03.3	00.7	182 28.6	115	22 40.2	+ 20
5	103 52.3	245 56.1	27.0	278 55.1	02.2	314 46.9	20.3	235 05.5	00.8	196 59.1	115	22 38.2	+ 20
6	118 54.8	260 55.5	-14 28.0	293 56.1	- 1 02.8	329 49.0	+13 20.2	250 07.7	-16 00.9	211 29.6	116	-22 36.2	+ 22
7	133 57.2	275 55.0	29.1	308 57.1	03.5	344 51.0	20.1	265 09.9	00.9	226 00.2	115	22 34.0	+ 22
8	148 59.7	290 54.4	30.2	323 58.1	04.1	359 53.1	19.9	280 12.0	01.0	240 30.7	116	22 31.8	+ 24
9	164 02.2	305 53.9	.. 31.2	338 59.1	.. 04.8	14 55.2	.. 19.8	295 14.2	.. 01.1	255 01.3	116	.. 22 29.4	+ 24
10	179 04.6	320 53.3	32.3	354 00.1	05.4	29 57.3	19.7	310 16.4	01.2	269 31.9	116	22 27.0	+ 26
11	194 07.1	335 52.7	33.4	9 01.1	06.0	44 59.4	19.6	325 18.6	01.2	284 02.5	117	22 24.4	+ 27
12	209 09.5	350 52.2	-14 34.4	24 02.1	- 1 06.7	60 01.5	+13 19.4	340 20.8	-16 01.3	298 33.2	116	-22 21.7	+ 27
13	224 12.0	5 51.6	35.5	39 03.1	07.3	75 03.6	19.3	355 22.9	01.4	313 03.8	117	22 19.0	+ 29
14	239 14.5	20 51.0	36.6	54 04.1	08.0	90 05.7	19.2	10 25.1	01.5	327 34.5	117	22 16.1	+ 30
15	254 16.9	35 50.5	.. 37.6	69 05.1	.. 08.6	105 07.8	.. 19.1	25 27.3	.. 01.6	342 05.2	118	.. 22 13.1	+ 31
16	269 19.4	50 49.9	38.7	84 06.1	09.3	120 09.9	18.9	40 29.5	01.6	356 36.0	117	22 10.0	+ 31
17	284 21.9	65 49.3	39.8	99 07.1	09.9	135 11.9	18.8	55 31.7	01.7	11 06.7	118	22 06.9	+ 33
18	299 24.3	80 48.8	-14 40.8	114 08.1	- 1 10.6	150 14.0	+13 18.7	70 33.9	-16 01.8	25 37.5	118	-22 03.6	+ 34
19	314 26.8	95 48.2	41.9	129 09.1	11.2	165 16.1	18.6	85 36.0	01.9	40 08.3	118	22 00.2	+ 35
20	329 29.3	110 47.6	42.9	144 10.0	11.8	180 18.2	18.4	100 38.2	02.0	54 39.1	119	21 56.7	+ 36
21	344 31.7	125 47.1	.. 44.0	159 11.0	.. 12.5	195 20.3	.. 18.3	115 40.4	.. 02.0	69 10.0	118	.. 21 53.1	+ 37
22	359 34.2	140 46.5	45.1	174 12.0	13.1	210 22.4	18.2	130 42.6	02.1	83 40.8	119	21 49.4	+ 38
23	14 36.7	155 45.9	46.1	189 13.0	13.8	225 24.5	18.1	145 44.8	02.2	98 11.7	120	21 45.6	+ 38
24	29 39.1	170 45.3	-14 47.2	204 14.0	- 1 14.4	240 26.6	+13 18.0	160 47.0	-16 02.3	112 42.7	119	-21 41.8	+ 40
code	-	- 6	- 11	+ 10	- 7	+ 21	- 1	+ 22	0				

G M T	SUN		STARS		Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.	No.	Name SHA Dec.				19	20	21	22	Alt.	Sun's Low'r Limb	Venus	Mars		
h	°	'		°	'	N	h m	h m	h m	h m	h m	h m	h m	°	'	'	'
19	0	183 41.7	- 9 37.1	7	Acamar 315 50.7	-40 28.6	72	7 45	3 50	■	■	■	■	Alt.	0	0.4	0.1
1	1	198 41.8	38.0	5	Achernar 335 58.2	-57 27.5	70	7 31	4 00	■	■	■	■	30	0.4	0.1	0.1
2	2	213 41.9	38.9	30	Acruz 173 58.4	-62 51.2	68	7 20	4 08	■	■	■	15 32	45	0.4	0.1	0.0
3	3	228 42.1	39.8	19	Adhara 255 46.4	-28 54.4	66	7 11	4 15	13 11	14 13	14 40	14 49	60	0.4	0.1	0.0
4	4	243 42.2	40.7	10	Aldebaran 291 38.8	+16 25.4	64	7 03	4 28	12 26	13 24	14 00	14 20	75	0.4	0.0	0.0
5	5	258 42.3	41.6				62	6 56	4 25	11 57	12 53	13 32	13 57	90	0.4	0.0	0.0
6	6	273 42.4	- 9 42.5	32	Alioth 166 59.0	+56 11.9	60	6 50	4 28	11 34	12 29	13 10	13 39				
7	7	288 42.5	43.4	34	Alkaid 153 33.3	+49 32.0	58	6 45	4 31	11 16	12 10	12 53	13 24				
8	8	303 42.7	44.3	55	Al Na'ir 28 37.6	-47 10.6	56	6 40	4 34	11 01	11 55	12 38	13 12				
9	9	318 42.8	45.2	15	Alnilam 276 30.0	- 1 13.6	54	6 36	4 36	10 48	11 41	12 25	13 00				
10	10	333 42.9	46.1	25	Alphard 218 38.7	- 8 27.9	52	6 32	4 38	10 36	11 30	12 14	12 50				
11	11	348 43.0	47.1				50	6 29	4 39	10 26	11 19	12 04	12 42				
12	12	3 43.1	- 9 48.0	41	Alphecca 126 47.9	+26 51.9	45	6 21	4 42	10 05	10 57	11 43	12 23	Moon's Lower Limb			
13	13	18 43.2	48.9	1	Alpheratz 358 28.0	+28 51.1	40	6 15	4 44	9 48	10 40	11 26	12 07	Add			
14	14	33 43.4	49.8	51	Altair 62 50.4	+ 8 45.3	35	6 10	4 45	9 34	10 25	11 12	11 54	Alt.	19	20	21
15	15	48 43.5	50.7	2	Ankaa 353 57.8	-42 32.6	30	6 05	4 44	9 21	10 12	10 59	11 43	°			
16	16	63 43.6	51.6	42	Antares 113 19.6	-26 20.1	20	5 56	4 42	9 00	9 50	10 38	11 24	0	12.2	12.0	12.0
17	17	78 43.7	52.5				10	5 49	4 39	8 41	9 31	10 20	11 06	4	12.3	12.0	12.0
18	18	93 43.8	- 9 53.4	37	Arcturus 146 35.5	+19 24.8	0	5 42	4 32	8 24	9 13	10 02	10 50	8	12.3	12.0	12.0
19	19	108 43.9	54.3	43	Atria 109 00.7	-68 57.1	10	5 34	4 24	8 07	8 56	9 45	10 35	12	12.3	12.1	12.1
20	20	123 44.0	55.2	22	Avior 234 35.8	-59 21.7	20	5 27	4 11	7 49	8 37	9 27	10 17	16	12.3	12.1	12.1
21	21	138 44.2	56.1	13	Bellatrix 279 18.2	+ 6 18.8	30	5 18	3 56	7 28	8 15	9 05	9 58	20	12.4	12.1	12.1
22	22	153 44.3	57.0	16	Betelge'se 271 47.9	+ 7 24.1	35	5 12	3 44	7 15	8 02	8 53	9 46	24	12.4	12.2	12.2
23	23	168 44.4	57.9				40	5 06	3 31	7 01	7 48	8 38	9 33	28	12.5	12.3	12.3
				17	Canopus 264 15.1	-52 40.0	45	4 59	3 13	6 44	7 30	8 21	9 17	32	12.6	12.4	12.4
20	0	183 44.5	- 9 58.8	12	Capella 281 38.1	+45 57.2	50	4 51	2 50	6 24	7 08	8 00	8 58	36	12.7	12.5	12.5
1	1	198 44.6	9 59.7	53	Deneb 50 00.9	+45 07.7	52	4 47	2 37	6 14	6 58	7 50	8 49	40	12.8	12.6	12.6
2	2	213 44.7	10 00.6	28	Denebola 183 18.0	+14 49.1	54	4 43	2 23	6 03	6 47	7 39	8 39	44	12.9	12.7	12.7
3	3	228 44.8	01.5	4	Diphda 349 38.9	-18 13.5	56	4 38	2 06	5 51	6 33	7 26	8 27	48	13.0	12.8	12.8
4	4	243 44.9	02.4				58	4 33	1 44	5 36	6 18	7 11	8 13	52	13.2	13.0	13.0
5	5	258 45.1	03.3	27	Dubhe 194 45.0	+61 59.2	60	4 26	1 12	5 19	5 59	6 53	7 58	56	13.3	13.1	13.1
6	6	273 45.2	-10 04.2	14	Elnath 279 07.1	+28 34.3	S							60	13.5	13.3	13.3
7	7	288 45.3	05.1	47	Eltanin 91 06.5	+51 29.9								64	13.6	13.5	13.5
8	8	303 45.4	06.0	54	Enif 34 29.4	+ 9 40.6	Lat.	Sunset	Twlt. ends	Moonset				68	13.8	13.6	13.6
9	9	318 45.5	06.9	56	Fomalhaut 16 11.3	-29 51.3	N	h m	h m	h m	h m	h m	h m	72	14.0	13.8	13.8
10	10	333 45.6	07.8											76	14.1	14.0	14.0
11	11	348 45.7	08.7	31	Gacrux 172 49.7	-56 51.9	72	15 43	19 34	■	■	■	■	80	14.3	14.2	14.2
12	12	3 45.8	-10 09.6	29	Gienah 176 37.1	-17 17.7	70	15 57	19 24	■	■	■	■	84	14.5	14.4	14.4
13	13	18 46.0	10.5	35	Hadar 149 50.0	-60 09.7	68	16 09	19 17	■	■	■	18 41	88	14.7	14.6	14.6
14	14	33 46.1	11.4	6	Hamal 328 49.2	+23 15.4	66	16 18	19 10	15 58	16 38	17 53	19 23	90	14.8	14.7	14.7
15	15	48 46.2	12.3	48	Kaus Aust. 84 41.3	-34 24.5	64	16 26	19 05	16 43	17 27	18 33	19 52	Add to table, back cover			
16	16	63 46.3	13.2				62	16 33	19 01	17 13	17 59	19 00	20 14				
17	17	78 46.4	14.1	40	Kochab 137 19.1	+74 20.2	60	16 39	18 58	17 35	18 22	19 22	20 31	Moon's Upper Limb			
18	18	93 46.5	-10 15.0	57	Markab 14 21.2	+14 58.3	58	16 44	18 55	17 54	18 41	19 39	20 46	Subtract			
19	19	108 46.6	15.9	8	Menkar 315 00.0	+ 3 55.2	56	16 49	18 53	18 09	18 56	19 54	20 58	Alt.	19	20	21
20	20	123 46.7	16.8	36	Menkent 148 59.0	-36 09.2	54	16 53	18 51	18 22	19 10	20 06	21 09	°			
21	21	138 46.8	17.7	24	Miap'dus 221 49.3	-69 31.9	52	16 57	18 49	18 34	19 22	20 17	21 19	0	17.4	17.6	17.6
22	22	153 46.9	18.6				50	17 00	18 48	18 44	19 32	20 27	21 27	4	17.4	17.6	17.6
23	23	168 47.0	19.5	9	Mirfak 309 41.9	+49 42.4	45	17 08	18 46	19 05	19 54	20 47	21 46	8	17.4	17.5	17.5
				50	Nunki 76 51.9	-26 21.2	40	17 14	18 44	19 23	20 11	21 04	22 00	12	17.4	17.5	17.5
21	0	183 47.1	-10 20.4	52	Peacock 54 27.1	-56 52.8	35	17 20	18 44	19 37	20 26	21 18	22 13	16	17.3	17.5	17.5
1	1	198 47.2	21.3	21	Pollux 244 20.5	+28 08.0	30	17 25	18 45	19 50	20 39	21 30	22 24	20	17.3	17.4	17.4
2	2	213 47.4	22.2	20	Procyon 245 44.9	+ 5 20.4	20	17 33	18 47	20 12	21 01	21 51	22 42	24	17.3	17.3	17.3
3	3	228 47.5	23.1				10	17 41	18 52	20 30	21 20	22 09	22 58	28	17.2	17.3	17.3
4	4	243 47.6	24.0	46	R'alhague 96 46.8	+12 35.6	0	17 48	18 58	20 48	21 37	22 26	23 13	32	17.1	17.2	17.2
5	5	258 47.7	24.9	26	Regulus 208 29.6	+12 11.0	10	17 56	19 07	21 06	21 55	22 42	23 28	36	17.0	17.1	17.1
6	6	273 47.8	-10 25.8	11	Rigel 281 53.4	- 8 14.9	20	18 04	19 20	21 24	22 14	23 00	23 44	40	16.9	17.0	17.0
7	7	288 47.9	26.7	38	Rigel Kent. 140 51.6	-60 39.3	30	18 13	19 37	21 46	22 35	23 21	24 02	44	16.8	16.9	16.9
8	8	303 48.0	27.6	44	Sabik 103 02.3	-15 40.3	35	18 18	19 47	21 59	22 48	23 33	24 13	48	16.6	16.7	16.7
9	9	318 48.1	28.5				40	18 24	20 01	22 13	23 02	23 46	24 25	52	16.5	16.6	16.6
10	10	333 48.2	29.4	3	Schedar 350 29.4	+56 18.0	45	18 32	20 20	22 31	23 20	24 02	0 02	56	16.4	16.4	16.4
11	11	348 48.3	30.3	45	Shaula 97 20.9	-37 04.5	50	18 40	20 44	22 52	23 41	24 22	0 22	60	16.2	16.3	16.3
12	12	3 48.4	-10 31.2	18	Sirius 259 11.7	-16 39.1	52	18 44	20 57	23 02	23 51	24 32	0 32	64	16.1	16.1	16.1
13	13	18 48.5	32.1	33	Spica 159 17.2	-10 55.8	54	18 49	21 12	23 14	24 03	0 03	0 42	68	15.9	15.9	15.9
14	14	33 48.6	33.0	23	Shail 223 24.4	-43 15.0	56	18 53	21 29	23 27	24 16	0 16	0 54	72	15.7	15.7	15.7
15	15	48 48.7	33.9				58	18 59	21 53	23 43	24 31	0 31	1 08	76	15.6	15.6	15.6
16	16	63 48.8	34.8	49	Vega 81 08.4	+38 44.8	60	19 05	22 28	24 01	0 01	0 49	1 24	80	15.4	15.4	15.4
17	17	78 48.9	35.7	39	Zub'g'bi 137 53.6	-15 51.5	S					</					

G M T	VENUS — 3.4		MARS 2.0		JUPITER — 1.5		SATURN 0.8		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
h	o	o	o	o	o	o	o	o	o	o	o	o
22	0	29 39.1	170 45.3	-14 47.2	204 14.0	- 1 14.4	240 26.6	+13 18.0	160 47.0	-16 02.3	112 42.7	119 -21 41.8+ 40
	1	44 41.6	185 44.8	48.2	219 15.0	15.1	255 28.7	17.8	175 49.1	02.3	127 13.6	120 21 37.8+ 41
	2	59 44.0	200 44.2	49.3	234 16.0	15.7	270 30.8	17.7	190 51.3	02.4	141 44.6	120 21 33.7+ 42
	3	74 46.5	215 43.6	.. 50.4	249 17.0	.. 16.3	285 32.9	.. 17.6	205 53.5	.. 02.5	156 15.6	120 -21 29.5+ 43
	4	89 49.0	230 43.1	51.4	264 18.0	17.0	300 35.0	17.5	220 55.7	02.6	170 46.6	120 21 25.2+ 44
	5	104 51.4	245 42.5	52.5	279 19.0	17.6	315 37.0	17.3	235 57.9	02.7	185 17.6	121 21 20.8+ 45
	6	119 53.9	260 41.9	-14 53.5	294 20.0	- 1 18.3	330 39.1	+13 17.2	251 00.0	-16 02.7	199 48.7	121 -21 16.3+ 46
	7	134 56.4	275 41.3	54.6	309 21.0	18.9	345 41.2	17.1	266 02.2	02.8	214 19.8	121 21 11.7+ 46
	8	149 58.8	290 40.8	55.6	324 22.0	19.6	0 43.3	17.0	281 04.4	02.9	228 50.9	122 21 07.1+ 48
	9	165 01.3	305 40.2	.. 56.7	339 23.0	.. 20.2	15 45.4	.. 16.8	296 06.6	.. 03.0	243 22.1	122 -21 02.3+ 49
	10	180 03.8	320 39.6	57.7	354 24.0	20.8	30 47.5	16.7	311 08.8	03.0	257 53.3	122 20 57.4+ 50
	11	195 06.2	335 39.0	58.8	9 25.0	21.5	45 49.6	16.6	326 10.9	03.1	272 24.5	122 20 52.4+ 50
	12	210 08.7	350 38.5	-14 59.8	24 26.0	- 1 22.1	60 51.7	+13 16.5	341 13.1	-16 03.2	286 55.7	123 -20 47.4+ 52
	13	225 11.1	5 37.9	15 00.9	39 27.0	22.8	75 53.8	16.4	356 15.3	03.3	301 27.0	123 20 42.2+ 52
	14	240 13.6	20 37.3	01.9	54 28.0	23.4	90 55.9	16.2	11 17.5	03.4	315 58.3	123 20 37.0+ 54
	15	255 16.1	35 36.7	.. 03.0	69 29.0	.. 24.1	105 58.0	.. 16.1	26 19.7	.. 03.4	330 29.6	123 -20 31.6+ 54
	16	270 18.5	50 36.2	04.0	84 29.9	24.7	121 00.1	16.0	41 21.9	03.5	345 00.9	124 20 26.2+ 56
	17	285 21.0	65 35.6	05.1	99 30.9	25.3	136 02.2	15.9	56 24.0	03.6	359 32.3	124 20 20.6+ 56
	18	300 23.5	80 35.0	-15 06.1	114 31.9	- 1 26.0	151 04.3	+13 15.7	71 26.2	-16 03.7	14 03.7	124 -20 15.0+ 57
	19	315 25.9	95 34.4	07.2	129 32.9	26.6	166 06.4	15.6	86 28.4	03.7	28 35.1	125 20 09.3+ 59
	20	330 28.4	110 33.8	08.2	144 33.9	27.3	181 08.5	15.5	101 30.6	03.8	43 06.6	124 20 03.4+ 59
	21	345 30.9	125 33.3	.. 09.3	159 34.9	.. 27.9	196 10.6	.. 15.4	116 32.8	.. 03.9	57 38.0	125 -19 57.5+ 60
	22	0 33.3	140 32.7	10.3	174 35.9	28.6	211 12.7	15.3	131 34.9	04.0	72 09.5	126 19 51.5+ 61
	23	15 35.8	155 32.1	11.3	189 36.9	29.2	226 14.8	15.1	146 37.1	04.1	86 41.1	125 19 45.4+ 62
23	0	30 38.3	170 31.5	-15 12.4	204 37.9	- 1 29.8	241 16.9	+13 15.0	161 39.3	-16 04.1	101 12.6	126 -19 39.2+ 62
	1	45 40.7	185 30.9	13.4	219 38.9	30.5	256 19.0	14.9	176 41.5	04.2	115 44.2	126 19 33.0+ 64
	2	60 43.2	200 30.3	14.5	234 39.9	31.1	271 21.1	14.8	191 43.7	04.3	130 15.8	127 19 26.6+ 65
	3	75 45.6	215 29.8	.. 15.5	249 40.9	.. 31.8	286 23.2	.. 14.6	206 45.8	.. 04.4	144 47.5	127 -19 20.1+ 65
	4	90 48.1	230 29.2	16.5	264 41.9	32.4	301 25.3	14.5	221 48.0	04.5	159 19.2	127 19 13.6+ 66
	5	105 50.6	245 28.6	17.6	279 42.9	33.1	316 27.3	14.4	236 50.2	04.5	173 50.9	127 19 07.0+ 68
	6	120 53.0	260 28.0	-15 18.6	294 43.9	- 1 33.7	331 29.4	+13 14.3	251 52.4	-16 04.6	188 22.6	127 -19 00.2+ 68
	7	135 55.5	275 27.4	19.7	309 44.9	34.3	346 31.5	14.2	266 54.6	04.7	202 54.3	128 18 53.4+ 69
	8	150 58.0	290 26.8	20.7	324 45.9	35.0	1 33.6	14.0	281 56.7	04.8	217 26.1	128 18 46.5+ 69
	9	166 00.4	305 26.2	.. 21.7	339 46.9	.. 35.6	16 35.7	.. 13.9	296 58.9	.. 04.8	231 57.9	128 -18 39.6+ 71
	10	181 02.9	320 25.7	22.8	354 47.8	36.3	31 37.8	13.8	312 01.1	04.9	246 29.7	129 18 32.5+ 72
	11	196 05.4	335 25.1	23.8	9 48.8	36.9	46 39.9	13.7	327 03.3	05.0	261 01.6	129 18 25.3+ 72
	12	211 07.8	350 24.5	-15 24.8	24 49.8	- 1 37.6	61 42.0	+13 13.6	342 05.5	-16 05.1	275 33.5	129 -18 18.1+ 73
	13	226 10.3	5 23.9	25.9	39 50.8	38.2	76 44.1	13.4	357 07.6	05.2	290 05.4	129 18 10.8+ 75
	14	241 12.8	20 23.3	26.9	54 51.8	38.8	91 46.2	13.3	12 09.8	05.2	304 37.3	130 18 03.3+ 74
	15	256 15.2	35 22.7	.. 27.9	69 52.8	.. 39.5	106 48.3	.. 13.2	27 12.0	.. 05.3	319 09.3	130 -17 55.9+ 76
	16	271 17.7	50 22.1	29.0	84 53.8	40.1	121 50.4	13.1	42 14.2	05.4	333 41.3	130 17 48.3+ 77
	17	286 20.1	65 21.5	30.0	99 54.8	40.8	136 52.5	13.0	57 16.4	05.5	348 13.3	130 17 40.6+ 77
	18	301 22.6	80 20.9	-15 31.0	114 55.8	- 1 41.4	151 54.6	+13 12.8	72 18.5	-16 05.5	2 45.3	131 -17 32.9+ 79
	19	316 25.1	95 20.3	32.1	129 56.8	42.1	166 56.7	12.7	87 20.7	05.6	17 17.4	131 17 25.0+ 79
	20	331 27.5	110 19.8	33.1	144 57.8	42.7	181 58.8	12.6	102 22.9	05.7	31 49.5	131 17 17.1+ 80
	21	346 30.0	125 19.2	.. 34.1	159 58.8	.. 43.3	197 00.9	.. 12.5	117 25.1	.. 05.8	46 21.6	131 -17 09.1+ 80
	22	1 32.5	140 18.6	35.2	174 59.8	44.0	212 03.0	12.4	132 27.3	05.9	60 53.7	132 17 01.1+ 82
	23	16 34.9	155 18.0	36.2	190 00.8	44.6	227 05.1	12.2	147 29.4	05.9	75 25.9	131 16 52.9+ 82
24	0	31 37.4	170 17.4	-15 37.2	205 01.8	- 1 45.3	242 07.3	+13 12.1	162 31.6	-16 06.0	89 58.0	132 -16 44.7+ 83
	1	46 39.9	185 16.8	38.2	220 02.8	45.9	257 09.4	12.0	177 33.8	06.1	104 30.2	132 16 36.4+ 84
	2	61 42.3	200 16.2	39.3	235 03.8	46.6	272 11.5	11.9	192 36.0	06.2	119 02.5	132 16 28.0+ 85
	3	76 44.8	215 15.6	.. 40.3	250 04.7	.. 47.2	287 13.6	.. 11.7	207 38.1	.. 06.3	133 34.7	133 -16 19.5+ 85
	4	91 47.3	230 15.0	41.3	265 05.7	47.8	302 15.7	11.6	222 40.3	06.3	148 07.0	133 16 11.0+ 87
	5	106 49.7	245 14.4	42.3	280 06.7	48.5	317 17.8	11.5	237 42.5	06.4	162 39.3	133 16 02.3+ 87
	6	121 52.2	260 13.8	-15 43.4	295 07.7	- 1 49.1	332 19.9	+13 11.4	252 44.7	-16 06.5	177 11.6	133 -15 53.6+ 87
	7	136 54.6	275 13.2	44.4	310 08.7	49.8	347 22.0	11.3	267 46.9	06.6	191 43.9	133 15 44.9+ 89
	8	151 57.1	290 12.6	45.4	325 09.7	50.4	2 24.1	11.1	282 49.0	06.6	206 16.2	134 15 36.0+ 89
	9	166 59.6	305 12.0	.. 46.4	340 10.7	.. 51.0	17 26.2	.. 11.0	297 51.2	.. 06.7	220 48.6	134 -15 27.1+ 90
	10	182 02.0	320 11.4	47.4	355 11.7	51.7	32 28.3	10.9	312 53.4	06.8	235 21.0	134 15 18.1+ 91
	11	197 04.5	335 10.8	48.5	10 12.7	52.3	47 30.4	10.8	327 55.6	06.9	249 53.4	134 15 09.0+ 92
	12	212 07.0	350 10.2	-15 49.5	25 13.7	- 1 53.0	62 32.5	+13 10.7	342 57.8	-16 07.0	264 25.8	135 -14 59.8+ 92
	13	227 09.4	5 09.6	50.5	40 14.7	53.6	77 34.6	10.6	357 59.9	07.0	278 58.3	134 14 50.6+ 93
	14	242 11.9	20 09.0	51.5	55 15.7	54.3	92 36.7	10.4	13 02.1	07.1	293 30.7	135 14 41.3+ 93
	15	257 14.4	35 08.4	.. 52.5	70 16.7	.. 54.9	107 38.8	.. 10.3	28 04.3	.. 07.2	308 03.2	135 -14 32.0+ 95
	16	272 16.8	50 07.8	53.5	85 17.7	55.5	122 40.9	10.2	43 06.5	07.3	322 35.7	135 14 22.5+ 95
	17	287 19.3	65 07.2	54.6	100 18.7	56.2	137 43.0	10.1	58 08.6	07.3	337 08.2	135 14 13.0+ 96
	18	302 21.7	80 06.6	-15 55.6	115 19.6	- 1 56.8	152 45.1	+13 10.0	73 10.8	-16 07.4	351 40.7	136 -14 03.4+ 96
	19	317 24.2	95 06.0	56.6	130 20.6	57.5	167 47.2	09.8	88 13.0	07.5	6 13.3	135 13 53.8+ 98
	20	332 26.7	110 05.4	57.6	145 21.6	58.1	182 49.3	09.7	103 15.2	07.6	20 45.8	136 13 44.0+ 98
	21	347 29.1	125 04.8	.. 58.6	160 22.6	.. 58.8	197 51.4	.. 09.6	118 17.4	.. 07.7	35 18.4	136 -13 34.2+ 98
	22	2 31.6	140 04.2	15 59.6	175 23.6	1 59.4	212 53.5	09.5	133 19.5	07.7	49 51.0	136 13 24.4+ 99
	23	17 34										

G M T	T		VENUS - 3.4			MARS 2.0			JUPITER - 1.5			SATURN 0.8			MOON			
	GHA		GHA	Dec.		GHA	Dec.		GHA	Dec.		GHA	Dec.		GHA	code	Dec.	code
h	°	'	°	'	°	°	'	°	°	'	°	°	'	°	°	'	°	'
25	0	32 36.5	170 03.0	-16 01.6	205 25.6	- 2 00.7	242 57.8	+13 09.2	163 23.9	-16 07.9	78 56.2	136	-13 04.5	+101				
	1	47 39.0	185 02.4	02.6	220 26.6	01.3	257 59.9	09.1	178 26.1	08.0	93 28.8	136	12 54.4	+101				
	2	62 41.5	200 01.8	03.7	235 27.6	02.0	273 02.0	09.0	193 28.3	08.1	108 01.4	136	12 44.3	+102				
	3	77 43.9	215 01.1	.. 04.7	250 28.6	.. 02.6	288 04.1	.. 08.9	208 30.4	.. 08.1	122 34.0	137	-12 34.1	+103				
	4	92 46.4	230 00.5	05.7	265 29.6	03.3	303 06.2	08.8	223 32.6	08.2	137 06.7	137	12 23.8	+103				
	5	107 48.9	244 59.9	06.7	280 30.6	03.9	318 08.3	08.7	238 34.8	08.3	151 39.4	136	12 13.5	+104				
	6	122 51.3	259 59.3	-16 07.7	295 31.6	- 2 04.5	333 10.4	+13 08.5	253 37.0	-16 08.4	166 12.0	137	-12 03.1	+104				
	7	137 53.8	274 58.7	08.7	310 32.6	05.2	348 12.5	08.4	268 39.1	08.4	180 44.7	137	11 52.7	+106				
	8	152 56.2	289 58.1	09.7	325 33.5	05.8	3 14.6	08.3	283 41.3	08.5	195 17.4	137	11 42.1	+105				
	9	167 58.7	304 57.5	.. 10.7	340 34.5	.. 06.5	18 16.7	.. 08.2	298 43.5	.. 08.6	209 50.1	136	-11 31.6	+107				
	10	183 01.2	319 56.9	11.7	355 35.5	07.1	33 18.8	08.1	313 45.7	08.7	224 22.7	137	11 20.9	+107				
	11	198 03.6	334 56.3	12.7	10 36.5	07.7	48 20.9	07.9	328 47.9	08.8	238 55.4	137	11 10.2	+107				
	12	213 06.1	349 55.7	-16 13.7	25 37.5	- 2 08.4	63 23.0	+13 07.8	343 50.0	-16 08.8	253 28.1	138	-10 59.5	+108				
	13	228 08.6	4 55.0	14.7	40 38.5	09.0	78 25.2	07.7	358 52.2	08.9	268 00.9	137	10 48.7	+109				
	14	243 11.0	19 54.4	15.7	55 39.5	09.7	93 27.3	07.6	13 54.4	09.0	282 33.6	137	10 37.8	+110				
	15	258 13.5	34 53.8	.. 16.7	70 40.5	.. 10.3	108 29.4	.. 07.5	28 56.6	.. 09.1	297 06.3	137	-10 26.8	+109				
	16	273 16.0	49 53.2	17.7	85 41.5	11.0	123 31.5	07.4	43 58.7	09.1	311 39.0	137	10 15.9	+111				
	17	288 18.4	64 52.6	18.7	100 42.5	11.6	138 33.6	07.2	59 00.9	09.2	326 11.7	137	10 04.8	+111				
	18	303 20.9	79 52.0	-16 19.7	115 43.5	- 2 12.2	153 35.7	+13 07.1	74 03.1	-16 09.3	340 44.4	137	- 9 53.7	+112				
	19	318 23.4	94 51.4	20.7	130 44.5	12.9	168 37.8	07.0	89 05.3	09.4	355 17.1	138	9 42.5	+112				
	20	333 25.8	109 50.7	21.7	145 45.5	13.5	183 39.9	06.9	104 07.4	09.5	9 49.9	137	9 31.3	+113				
	21	348 28.3	124 50.1	.. 22.7	160 46.5	.. 14.2	198 42.0	.. 06.8	119 09.6	.. 09.5	24 22.6	137	9 20.0	+113				
	22	3 30.7	139 49.5	23.7	175 47.4	14.8	213 44.2	06.6	134 11.8	09.6	38 55.3	137	9 08.7	+114				
	23	18 33.2	154 48.9	24.7	190 48.4	15.4	228 46.3	06.5	149 14.0	09.7	53 28.0	137	8 57.3	+114				
26	0	33 35.7	169 48.3	-16 25.7	205 49.4	- 2 16.1	243 48.4	+13 06.4	164 16.2	-16 09.8	68 00.7	137	- 8 45.9	+115				
	1	48 38.1	184 47.6	26.6	220 50.4	16.7	258 50.5	06.3	179 18.3	09.8	82 33.4	137	8 34.4	+115				
	2	63 40.6	199 47.0	27.6	235 51.4	17.4	273 52.6	06.2	194 20.5	09.9	97 06.1	137	8 22.9	+116				
	3	78 43.1	214 46.4	.. 28.6	250 52.4	.. 18.0	288 54.7	.. 06.1	209 22.7	.. 10.0	111 38.8	136	8 11.3	+117				
	4	93 45.5	229 45.8	29.6	265 53.4	18.6	303 56.8	05.9	224 24.9	10.1	126 11.4	137	7 59.6	+117				
	5	108 48.0	244 45.2	30.6	280 54.4	19.3	318 58.9	05.8	239 27.0	10.2	140 44.1	137	7 47.9	+117				
	6	123 50.5	259 44.5	-16 31.6	295 55.4	- 2 19.9	334 01.0	+13 05.7	254 29.2	-16 10.2	155 16.8	136	- 7 36.2	+118				
	7	138 52.9	274 43.9	32.6	310 56.4	20.6	349 03.2	05.6	269 31.4	10.3	169 49.4	137	7 24.4	+118				
	8	153 55.4	289 43.3	33.6	325 57.4	21.2	4 05.3	05.5	284 33.6	10.4	184 22.1	136	7 12.6	+119				
	9	168 57.8	304 42.7	.. 34.6	340 58.4	.. 21.9	19 07.4	.. 05.4	299 35.7	.. 10.5	198 54.7	136	7 00.7	+119				
	10	184 00.3	319 42.1	35.5	355 59.4	22.5	34 09.5	05.2	314 37.9	10.6	213 27.3	136	6 48.8	+120				
	11	199 02.8	334 41.4	36.5	11 00.3	23.1	49 11.6	05.1	329 40.1	10.6	227 59.9	136	6 36.8	+120				
	12	214 05.2	349 40.8	-16 37.5	26 01.3	- 2 23.8	64 13.7	+13 05.0	344 42.3	-16 10.7	242 32.5	136	- 6 24.8	+121				
	13	229 07.7	4 40.2	38.5	41 02.3	24.4	79 15.8	04.9	359 44.4	10.8	257 05.1	136	6 12.7	+121				
	14	244 10.2	19 39.5	39.5	56 03.3	25.1	94 18.0	04.8	14 46.6	10.9	271 37.7	135	6 00.6	+121				
	15	259 12.6	34 38.9	.. 40.5	71 04.3	.. 25.7	109 20.1	.. 04.7	29 48.8	.. 10.9	286 10.2	135	5 48.5	+122				
	16	274 15.1	49 38.3	41.4	86 05.3	26.3	124 22.2	04.5	44 51.0	11.0	300 42.7	136	5 36.3	+123				
	17	289 17.6	64 37.7	42.4	101 06.3	27.0	139 24.3	04.4	59 53.2	11.1	315 15.3	135	5 24.0	+122				
	18	304 20.0	79 37.0	-16 43.4	116 07.3	- 2 27.6	154 26.4	+13 04.3	74 55.3	-16 11.2	329 47.8	134	- 5 11.8	+123				
	19	319 22.5	94 36.4	44.4	131 08.3	28.3	169 28.5	04.2	89 57.5	11.3	344 20.2	135	4 59.5	+124				
	20	334 25.0	109 35.8	45.4	146 09.3	28.9	184 30.6	04.1	104 59.7	11.3	358 52.7	134	4 47.1	+124				
	21	349 27.4	124 35.2	.. 46.3	161 10.3	.. 29.5	199 32.8	.. 04.0	120 01.9	.. 11.4	13 25.1	134	4 34.7	+124				
	22	4 29.9	139 34.5	47.3	176 11.3	30.2	214 34.9	03.9	135 04.0	11.5	27 57.5	134	4 22.3	+124				
	23	19 32.3	154 33.9	48.3	191 12.2	30.8	229 37.0	03.7	150 06.2	11.6	42 29.9	134	4 09.9	+125				
27	0	34 34.8	169 33.3	-16 49.3	206 13.2	- 2 31.5	244 39.1	+13 03.6	165 08.4	-16 11.6	57 02.3	133	- 3 57.4	+126				
	1	49 37.3	184 32.6	50.2	221 14.2	32.1	259 41.2	03.5	180 10.6	11.7	71 34.6	133	3 44.8	+125				
	2	64 39.7	199 32.0	51.2	236 15.2	32.7	274 43.3	03.4	195 12.7	11.8	86 06.9	133	3 32.3	+126				
	3	79 42.2	214 31.4	.. 52.2	251 16.2	.. 33.4	289 45.5	.. 03.3	210 14.9	.. 11.9	100 39.2	133	3 19.7	+127				
	4	94 44.7	229 30.7	53.2	266 17.2	34.0	304 47.6	03.2	225 17.1	12.0	115 11.5	132	3 07.0	+126				
	5	109 47.1	244 30.1	54.1	281 18.2	34.7	319 49.7	03.0	240 19.3	12.0	129 43.7	132	2 54.4	+127				
	6	124 49.6	259 29.5	-16 55.1	296 19.2	- 2 35.3	334 51.8	+13 02.9	255 21.4	-16 12.1	144 15.9	132	- 2 41.7	+127				
	7	139 52.1	274 28.8	56.1	311 20.2	36.0	349 53.9	02.8	270 23.6	12.2	158 48.1	131	2 29.0	+128				
	8	154 54.5	289 28.2	57.0	326 21.2	36.6	4 56.0	02.7	285 25.8	12.3	173 20.2	131	2 16.2	+127				
	9	169 57.0	304 27.6	.. 58.0	341 22.2	.. 37.2	19 58.2	.. 02.6	300 28.0	.. 12.3	187 52.3	131	2 03.5	+128				
	10	184 59.5	319 26.9	59.0	356 23.1	37.9	35 00.3	02.5	315 30.1	12.4	202 24.4	131	1 50.7	+129				
	11	200 01.9	334 26.3	16 59.9	11 24.1	38.5	50 02.4	02.4	330 32.3	12.5	216 56.5	130	1 37.8	+128				
	12	215 04.4	349 25.6	-17 00.9	26 25.1	- 2 39.2	65 04.5	+13 02.2	345 34.5	-16 12.6	231 28.5	129	- 1 25.0	+129				
	13	230 06.8	4 25.0	01.9	41 26.1	39.8	80 06.6	02.1	0 36.7	12.7	246 00.4	130	1 12.1	+129				
	14	245 09.3	19 24.4	02.8	56 27.1	40.4	95 08.8	02.0	15 38.8	12.7	260 32.4	129	0 59.2	+129				
	15	260 11.8	34 23.7	.. 03.8	71 28.1	.. 41.1	110 10.9	.. 01.9	30 41.0	.. 12.8	275 04.3	128	0 46.3	+130				
	16	275 14.2	49 23.1	04.8	86 29.1	41.7	125 13.0	01.8	45 43.2	12.9	289 36.1	128	0 33.3	+129				
	17	290 16.7	64 22.5	05.7	101 30.1	42.4	140 15.1	01.7	60 45.4	13.0	304 07.9	128	0 20.4	+130				
	18	305 19.2	79 21.8	-17 06.7	116 31.1	- 2 43.0	155 17.2	+13 01.6	75 47.5	-16 13.1	318 39.7	128	- 0 07.4	+130				
</																		

G M T	SUN		STARS				Lat.	Sunrise	Twit. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS			
	GHA	Dec.	No.	Name	SHA	Dec.				25	26	27	28	Alt.	Sun's Low'r Limb Add	Venus Add	Mars Add
25	0	183 56.1 -11 45.3	7	Acamar	315 50.6 -40 28.7	72	8 17	4 17	15 31	15 10	14 51	14 32					
	1	198 56.2 46.2	5	Achernar	335 58.2 -57 27.5	70	7 58	4 24	15 15	15 02	14 50	14 38					
	2	213 56.3 47.0	30	Acruz	173 58.4 -62 51.2	68	7 43	4 29	15 01	14 55	14 49	14 43					
	3	228 56.4 47.9	19	Adhara	255 46.4 -28 54.4	66	7 31	4 34	14 51	14 49	14 48	14 47					
	4	243 56.4 48.8	10	Aldebaran	291 38.7 +16 25.4	64	7 21	4 37	14 41	14 45	14 47	14 50					
	5	258 56.5 49.6				62	7 12	4 40	14 34	14 40	14 47	14 53					
	6	273 56.6 -11 50.5	32	Alioth	166 59.0 +56 11.8	60	7 05	4 42	14 27	14 37	14 46	14 56					
	7	288 56.7 51.4	34	Alkaid	153 33.3 +49 32.0	58	6 58	4 44	14 21	14 34	14 46	14 58					
	8	303 56.7 52.2	55	Al Na'ir	28 37.7 -47 10.6	56	6 53	4 46	14 15	14 31	14 45	15 00					
	9	318 56.8 53.1	15	Alnilam	276 30.0 -1 13.6	54	6 47	4 47	14 11	14 28	14 45	15 02					
	10	333 56.9 54.0	25	Alphard	218 38.6 -8 27.9	52	6 43	4 48	14 06	14 26	14 45	15 04					
	11	348 57.0 54.8				50	6 38	4 49	14 02	14 23	14 44	15 05					
	12	3 57.0 -11 55.7	41	Alphecca	126 47.9 +26 51.8	45	6 29	4 50	13 54	14 19	14 43	15 09					
	13	18 57.1 56.6	1	Alpheratz	358 28.0 +28 51.1	40	6 21	4 49	13 46	14 15	14 43	15 12					
	14	33 57.2 57.4	51	Altair	62 50.4 +8 45.3	35	6 15	4 49	13 40	14 11	14 42	15 14					
	15	48 57.3 58.3	2	Ankaa	353 57.8 -42 32.7	30	6 09	4 48	13 35	14 08	14 42	15 16					
	16	63 57.3 11 59.2	42	Antares	113 19.6 -26 20.1	20	5 59	4 44	13 25	14 03	14 41	15 20					
	17	78 57.4 12 00.0				10	5 49	4 38	13 17	13 58	14 40	15 24					
	18	93 57.5 -12 00.9	37	Arcturus	146 35.5 +19 24.7	0	5 41	4 31	13 09	13 54	14 40	15 27					
	19	108 57.6 01.7	43	Atria	109 00.7 -68 57.1	10	5 32	4 20	13 01	13 49	14 39	15 30					
	20	123 57.6 02.6	22	Avior	234 35.8 -59 21.7	20	5 22	4 07	12 52	13 45	14 38	15 34					
	21	138 57.7 03.5	13	Bellatrix	279 18.1 +6 18.8	30	5 11	3 47	12 43	13 39	14 38	15 38					
	22	153 57.8 04.3	16	Betelge'se	271 47.9 +7 24.1	35	5 05	3 35	12 37	13 36	14 37	15 41					
	23	168 57.9 05.2				40	4 58	3 20	12 30	13 33	14 37	15 43					
			17	Canopus	264 15.1 -52 40.0	45	4 49	3 00	12 23	13 29	14 36	15 46					
			12	Capella	281 38.0 +45 57.2	50	4 39	2 32	12 14	13 24	14 36	15 50					
			53	Deneb	50 00.9 +45 07.7	52	4 34	2 17	12 10	13 21	14 35	15 52					
			28	Denebola	183 17.9 +14 49.1	54	4 29	2 00	12 05	13 19	14 35	15 54					
			4	Diphda	349 38.9 -18 13.6	56	4 23	1 37	12 00	13 16	14 35	15 56					
			27	Dubhe	194 44.9 +61 59.1	58	4 16	1 06	11 54	13 13	14 34	15 59					
			14	Elnath	279 07.0 +28 34.3	60	4 09	///	11 48	13 10	14 34	16 01					
			47	Eltanin	91 06.5 +51 29.9												
			54	Enif	34 29.4 +9 40.6												
			56	Fomalhaut	16 11.3 -29 51.3												

G M T	VENUS -3.3		MARS 2.0		JUPITER -1.5		SATURN 0.7		MOON				
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code	
28	h	°	°	°	°	°	°	°	°	°	°	°	
	0	35 33.9	169 18.0	-17 12.4	206 37.0	-2 46.8	245 30.0	+13 00.9	166 00.6	-16 13.5	45 49.5	124 +	1 10.8+131
	1	50 36.4	184 17.3	13.4	221 38.0	47.5	260 32.1	00.8	181 02.8	13.6	60 20.9	125	1 23.9+131
	2	65 38.9	199 16.7	14.3	236 39.0	48.1	275 34.2	00.6	196 04.9	13.7	74 52.4	123	1 37.0+131
	3	80 41.3	214 16.0	.. 15.3	251 40.0	.. 48.8	290 36.3	.. 00.5	211 07.1	.. 13.8	89 23.7	124	1 50.1+131
	4	95 43.8	229 15.4	16.2	266 41.0	49.4	305 38.4	00.4	226 09.3	13.8	103 55.1	122	2 03.2+132
	5	110 46.3	244 14.7	17.2	281 42.0	50.0	320 40.6	00.3	241 11.5	13.9	118 26.3	122	2 16.4+131
	6	125 48.7	259 14.1	-17 18.2	296 42.9	-2 50.7	335 42.7	+13 00.2	256 13.6	-16 14.0	132 57.5	122 +	2 29.5+131
	7	140 51.2	274 13.4	19.1	311 43.9	51.3	350 44.8	00.1	271 15.8	14.1	147 28.7	121	2 42.6+132
	8	155 53.7	289 12.8	20.1	326 44.9	52.0	5 46.9	13 00.0	286 18.0	14.1	161 59.8	121	2 55.8+131
	9	170 56.1	304 12.1	.. 21.0	341 45.9	.. 52.6	20 49.1	-12 59.8	301 20.2	.. 14.2	176 30.9	120	3 08.9+131
	10	185 58.6	319 11.5	21.9	356 46.9	53.2	35 51.2	59.7	316 22.3	14.3	191 01.9	119	3 22.0+132
	11	201 01.1	334 10.8	22.9	11 47.9	53.9	50 53.3	59.6	331 24.5	14.4	205 32.8	119	3 35.2+131
	12	216 03.5	349 10.2	-17 23.8	26 48.9	-2 54.5	65 55.4	+12 59.5	346 26.7	-16 14.5	220 03.7	118 +	3 48.3+132
	13	231 06.0	4 09.5	24.8	41 49.9	55.2	80 57.6	59.4	1 28.9	14.5	234 34.5	118	4 01.5+131
	14	246 08.4	19 08.9	25.7	56 50.9	55.8	95 59.7	59.3	16 31.0	14.6	249 05.3	117	4 14.6+131
	15	261 10.9	34 08.2	.. 26.7	71 51.9	.. 56.4	111 01.8	.. 59.2	31 33.2	.. 14.7	263 36.0	117	4 27.7+132
	16	276 13.4	49 07.6	27.6	86 52.8	57.1	126 03.9	59.1	46 35.4	14.8	278 06.7	116	4 40.9+131
	17	291 15.8	64 06.9	28.6	101 53.8	57.7	141 06.1	58.9	61 37.5	14.9	292 37.3	115	4 54.0+131
	18	306 18.3	79 06.3	-17 29.5	116 54.8	-2 58.3	156 08.2	+12 58.8	76 39.7	-16 14.9	307 07.8	114 +	5 07.1+131
	19	321 20.8	94 05.6	30.5	131 55.8	59.0	171 10.3	58.7	91 41.9	15.0	321 38.2	114	5 20.2+131
	20	336 23.2	109 05.0	31.4	146 56.8	2 59.6	186 12.4	58.6	106 44.1	15.1	336 08.6	114	5 33.3+131
	21	351 25.7	124 04.3	.. 32.3	161 57.8	.. 3 00.3	201 14.6	.. 58.5	121 46.2	.. 15.2	350 39.0	112	5 46.4+130
	22	6 28.2	139 03.7	33.3	176 58.8	00.9	216 16.7	58.4	136 48.4	15.2	5 09.2	112	5 59.4+131
23	21 30.6	154 03.0	34.2	191 59.8	01.5	231 18.8	58.3	151 50.6	15.3	19 39.4	112	6 12.5+130	
29	0	36 33.1	169 02.4	-17 35.1	207 00.8	-3 02.2	246 20.9	+12 58.2	166 52.8	-16 15.4	34 09.6	110 +	6 25.5+130
	1	51 35.6	184 01.7	36.1	222 01.7	02.8	261 23.1	58.0	181 54.9	15.5	48 39.6	110	6 38.5+130
	2	66 38.0	199 01.0	37.0	237 02.7	03.5	276 25.2	57.9	196 57.1	15.6	63 09.6	109	6 51.5+130
	3	81 40.5	214 00.4	.. 38.0	252 03.7	.. 04.1	291 27.3	.. 57.8	211 59.3	.. 15.6	77 39.5	109	7 04.5+130
	4	96 42.9	228 59.7	38.9	267 04.7	04.7	306 29.4	57.7	227 01.5	15.7	92 09.4	107	7 17.5+129
	5	111 45.4	243 59.1	39.8	282 05.7	05.4	321 31.6	57.6	242 03.6	15.8	106 39.1	107	7 30.4+129
	6	126 47.9	258 58.4	-17 40.8	297 06.7	-3 06.0	336 33.7	+12 57.5	257 05.8	-16 15.9	121 08.8	107 +	7 43.3+129
	7	141 50.3	273 57.7	41.7	312 07.7	06.7	351 35.8	57.4	272 08.0	15.9	135 38.5	105	7 56.2+128
	8	156 52.8	288 57.1	42.6	327 08.7	07.3	6 38.0	57.3	287 10.2	16.0	150 08.0	105	8 09.0+129
	9	171 55.3	303 56.4	.. 43.6	342 09.7	.. 07.9	21 40.1	.. 57.1	302 12.3	.. 16.1	164 37.5	104	8 21.9+128
	10	186 57.7	318 55.8	44.5	357 10.6	08.6	36 42.2	57.0	317 14.5	16.2	179 06.9	103	8 34.7+127
	11	202 00.2	333 55.1	45.4	12 11.6	09.2	51 44.3	56.9	332 16.7	16.3	193 36.2	103	8 47.4+128
	12	217 02.7	348 54.4	-17 46.3	27 12.6	-3 09.9	66 46.5	+12 56.8	347 18.8	-16 16.3	208 05.5	101 +	9 00.2+127
	13	232 05.1	3 53.8	47.3	42 13.6	10.5	81 48.6	56.7	2 21.0	16.4	222 34.6	101	9 12.9+126
	14	247 07.6	18 53.1	48.2	57 14.6	11.1	96 50.7	56.6	17 23.2	16.5	237 03.7	100	9 25.5+126
	15	262 10.0	33 52.4	.. 49.1	72 15.6	.. 11.8	111 52.9	.. 56.5	32 25.4	.. 16.6	251 32.7	99	9 38.1+126
	16	277 12.5	48 51.8	50.0	87 16.6	12.4	126 55.0	56.4	47 27.5	16.6	266 01.6	99	9 50.7+126
	17	292 15.0	63 51.1	51.0	102 17.6	13.0	141 57.1	56.3	62 29.7	16.7	280 30.5	97	10 03.3+125
	18	307 17.4	78 50.4	-17 51.9	117 18.6	-3 13.7	156 59.2	+12 56.1	77 31.9	-16 16.8	294 59.2	97 +10	15.8+124
	19	322 19.9	93 49.8	52.8	132 19.5	14.3	172 01.4	56.0	92 34.1	16.9	309 27.9	96	10 28.2+124
	20	337 22.4	108 49.1	53.7	147 20.5	15.0	187 03.5	55.9	107 36.2	17.0	323 56.5	95	10 40.6+124
	21	352 24.8	123 48.4	.. 54.7	162 21.5	.. 15.6	202 05.6	.. 55.8	122 38.4	.. 17.0	338 25.0	95	-10 53.0+123
	22	7 27.3	138 47.8	55.6	177 22.5	16.2	217 07.8	55.7	137 40.6	17.1	352 53.5	93	11 05.3+123
	23	22 29.8	153 47.1	56.5	192 23.5	16.9	232 09.9	55.6	152 42.7	17.2	7 21.8	93	11 17.6+122
30	0	37 32.2	168 46.4	-17 57.4	207 24.5	-3 17.5	247 12.0	+12 55.5	167 44.9	-16 17.3	21 50.1	91 +11	29.8+121
	1	52 34.7	183 45.8	58.3	222 25.5	18.2	262 14.2	55.4	182 47.1	17.3	36 18.2	91	11 41.9+121
	2	67 37.2	198 45.1	17 59.2	237 26.5	18.8	277 16.3	55.3	197 49.3	17.4	50 46.3	90	11 54.0+121
	3	82 39.6	213 44.4	-18 00.2	252 27.4	.. 19.4	292 18.4	.. 55.2	212 51.4	.. 17.5	65 14.3	89	-12 06.1+119
	4	97 42.1	228 43.8	01.1	267 28.4	20.1	307 20.6	55.0	227 53.6	17.6	79 42.2	88	12 18.0+120
	5	112 44.5	243 43.1	02.0	282 29.4	20.7	322 22.7	54.9	242 55.8	17.7	94 10.0	88	12 30.0+118
	6	127 47.0	258 42.4	-18 02.9	297 30.4	-3 21.3	337 24.8	+12 54.8	257 58.0	-16 17.7	108 37.8	86	+12 41.8+118
	7	142 49.5	273 41.7	03.8	312 31.4	22.0	352 27.0	54.7	273 00.1	17.8	123 05.4	86	12 53.6+118
	8	157 51.9	288 41.1	04.7	327 32.4	22.6	7 29.1	54.6	288 02.3	17.9	137 33.0	84	13 05.4+116
	9	172 54.4	303 40.4	.. 05.6	342 33.4	.. 23.3	22 31.2	.. 54.5	303 04.5	.. 18.0	152 00.4	84	-13 17.0+116
	10	187 56.9	318 39.7	06.5	357 34.4	23.9	37 33.4	54.4	318 06.6	18.1	166 27.8	83	13 28.6+115
	11	202 59.3	333 39.0	07.5	12 35.3	24.5	52 35.5	54.3	333 08.8	18.1	180 55.1	82	13 40.1+115
	12	218 01.8	348 38.4	-18 08.4	27 36.3	-3 25.2	67 37.6	+12 54.2	348 11.0	-16 18.2	195 22.3	81	+13 51.6+114
	13	233 04.3	3 37.7	09.3	42 37.3	25.8	82 39.8	54.1	3 13.2	18.3	209 49.4	80	14 03.0+113
	14	248 06.7	18 37.0	10.2	57 38.3	26.4	97 41.9	53.9	18 15.3	18.4	224 16.4	79	14 14.3+112
	15	263 09.2	33 36.3	.. 11.1	72 39.3	.. 27.1	112 44.0	.. 53.8	33 17.5	.. 18.4	238 43.3	78	-14 25.5+111
	16	278 11.7	48 35.7	12.0	87 40.3	27.7	127 46.2	53.7	48 19.7	18.5	253 10.1	78	14 36.6+111
	17	293 14.1	63 35.0	12.9	102 41.3	28.4	142 48.3	53.6	63 21.8	18.6	267 36.9	76	14 47.7+110
	18	308 16.6	78 34.3	-18 13.8	117 42.3	-3 29.0	157 50.4	+12 53.5	78 24.0	-16 18.7	282 03.5	76	+14 58.7+109
	19	323 19.0	93 33.6	14.7	132 43.2	29.6	172 52.6	53.4	93 26.2	18.8	296 30.1	74	15 09.6+108
	20	338 21.5	108 32.9	15.6	147 44.2	30.3	187 54.7	53.3	108 28.4	18.8	310 56.5	74	15 20.4+107
	21	353 24.0	123 32.3	.. 16.5	162 45.2	.. 30.9	202 56.8	.. 53.2	123 30.5	.. 18.9	325 22.9	73	-15 31.1+107
	22	8 26.4	138 31.6	17.4	177 46.2	31.6	217 59.0	53.1	138 32.7	19.0	339 49.2	72	15 41.8+105
	23	23 28.9	153 30.9	18.3	192 47.2	32.2	233 01.1	53.0	153 34.9	19.1	354 15.4	71	15 52.3+104
24	38 31.4.												

G M T	SUN		STARS		Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS							
	GHA	Dec.	No.	Name				SHA	Dec.	28	29	30	31	Alt.	Sun's Low'r Limb Add	Venus Add	Mars Add		
28	0	184 01.0 -12 47.0	7	Acamar	315 50.6 -40 28.7	72	8 34	4 30	14 32	14 11	13 41	12 18							
	1	199 01.1 47.9	5	Achernar	335 58.2 -57 27.6	70	8 12	4 35	14 38	14 25	14 09	13 41							
	2	214 01.1 48.7	30	Acrux	173 58.4 -62 51.2	68	7 55	4 39	14 43	14 36	14 29	14 21							
	3	229 01.2 .. 49.6	19	Adhara	255 46.3 -28 54.5	66	7 42	4 42	14 47	14 46	14 46	14 48							
	4	244 01.3 50.4	10	Aldebaran	291 38.7 +16 25.4	64	7 30	4 45	14 50	14 54	15 00	15 09							
	5	259 01.3 51.3				62	7 21	4 47	14 53	15 01	15 11	15 27							
	6	274 01.4 -12 52.1	32	Alioth	166 59.0 +56 11.8	60	7 13	4 49	14 56	15 07	15 21	15 41							
	7	289 01.4 53.0	34	Alkaid	153 33.3 +49 31.9	58	7 05	4 50	14 58	15 12	15 30	15 53							
	8	304 01.5 53.8	55	Al Na'ir	28 37.7 -47 10.6	56	6 59	4 52	15 00	15 17	15 37	16 04							
	9	319 01.5 .. 54.6	15	Alnilam	276 30.0 -1 13.6	54	6 53	4 52	15 02	15 21	15 44	16 14							
	10	334 01.6 55.5	25	Alphard	128 38.6 -8 27.9	52	6 48	4 52	15 04	15 25	15 50	16 22							
	11	349 01.6 56.3				50	6 43	4 53	15 05	15 29	15 56	16 30							
	12	4 01.7 -12 57.2	41	Alphecca	126 47.9 +26 51.8	45	6 33	4 53	15 09	15 36	16 08	16 46							
	13	19 01.7 58.0	1	Alpheratz	358 28.0 +28 51.1	40	6 25	4 53	15 12	15 43	16 18	16 59							
	14	34 01.8 58.9	51	Altair	62 50.4 +8 45.2	35	6 18	4 52	15 14	15 49	16 27	17 11							
	15	49 01.9 -12 59.7	2	Ankaa	353 57.8 -42 32.7	30	6 11	4 49	15 16	15 53	16 35	17 21							
	16	64 01.9 13 00.5	42	Antares	113 19.6 -26 20.1	20	6 00	4 45	15 20	16 02	16 48	17 38							
	17	79 02.0 01.4				10	5 50	4 39	15 24	16 10	17 00	17 54							
	18	94 02.0 -13 02.2	37	Arcturus	146 35.5 +19 24.7	0	5 40	4 30	15 27	16 17	17 11	18 08							
	19	109 02.1 03.1	43	Atria	109 00.7 -68 57.1	10	5 31	4 19	15 30	16 25	17 22	18 22							
	20	124 02.1 03.9	22	Avior	234 35.7 -59 21.7	20	5 20	4 04	15 34	16 32	17 34	18 38							
	21	139 02.2 .. 04.7	13	Bellatrix	279 18.1 +6 18.8	30	5 09	3 45	15 38	16 42	17 48	18 56							
	22	154 02.2 05.6	16	Betelge'se	271 47.9 +7 24.1	35	5 02	3 31	15 41	16 47	17 56	19 06							
	23	169 02.3 06.4				40	4 54	3 14	15 43	16 53	18 05	19 19							
			17	Canopus	264 15.1 -52 40.0	45	4 44	2 53	15 46	17 00	18 16	19 33							
			12	Capella	281 38.0 +45 57.2	50	4 33	2 23	15 50	17 08	18 29	19 50							
			53	Deneb	50 00.9 +45 07.7	52	4 28	2 07	15 52	17 12	18 35	19 59							
			28	Denebola	183 17.9 +14 49.1	54	4 22	1 47	15 54	17 17	18 42	20 08							
			4	Diphda	349 38.9 -18 13.6	56	4 16	1 21	15 56	17 21	18 49	20 18							
						58	4 09	0 39	15 59	17 27	18 58	20 30							
			27	Dubhe	194 44.9 +61 59.1	60	4 00	0 00	16 01	17 33	19 08	20 44							
			14	Elnath	279 07.0 +28 34.3	S													
			47	Eltanin	91 06.5 +51 29.9														
			54	Enif	34 29.4 +9 40.6	Lat.	Sunset	Twlt. ends	Moonset										
			56	Fomalhaut	16 11.3 -29 51.3	N.			28	29	30	31							
			31	Gacrux	172 49.7 -56 51.9	72	14 52	18 52	3 25	5 30	7 49	11 09							
			29	Gienah	176 37.1 -17 17.7	70	15 14	18 48	3 23	5 18	7 23	9 48							
			35	Hadar	149 50.0 -60 09.6	68	15 31	18 44	3 21	5 09	7 04	9 10							
			6	Hamal	328 49.2 +23 15.5	66	15 45	18 41	3 19	5 01	6 49	8 43							
			48	Kaus Aust.	84 41.3 -34 24.5	64	15 56	18 38	3 17	4 54	6 36	8 23							
						62	16 06	18 37	3 16	4 49	6 26	8 06							
			40	Kochab	137 19.1 +74 20.2	60	16 14	18 35	3 15	4 44	6 17	7 53							
			57	Markab	14 21.2 +14 58.3	58	16 21	18 34	3 14	4 40	6 09	7 41							
			8	Menkar	314 59.9 +3 55.2	56	16 28	18 34	3 13	4 36	6 02	7 31							
			36	Menkent	148 59.0 -36 09.2	54	16 33	18 32	3 12	4 33	5 56	7 22							
			24	Miapl'dus	221 49.2 -69 31.9	52	16 39	18 33	3 12	4 30	5 51	7 14							
						50	16 43	18 32	3 11	4 27	5 46	7 07							
			9	Mirfak	309 41.8 +49 42.4	45	16 54	18 33	3 10	4 21	5 35	6 52							
			50	Nunki	76 52.0 -26 21.2	40	17 02	18 33	3 08	4 16	5 27	6 40							
			52	Peacock	54 27.2 -56 52.8	35	17 10	18 35	3 07	4 12	5 19	6 29							
			21	Pollux	244 20.4 +28 08.0	30	17 16	18 37	3 06	4 08	5 12	6 20							
			20	Procyon	245 44.8 +5 20.4	20	17 28	18 42	3 05	4 02	5 01	6 04							
						10	17 38	18 49	3 03	3 56	4 51	5 50							
						0	17 47	18 58	3 02	3 50	4 42	5 37							
			46	R'alhague	96 46.8 +12 35.6	10	17 57	19 09	3 01	3 45	4 33	5 25							
			26	Regulus	208 29.6 +12 11.0	20	18 07	19 24	2 59	3 40	4 23	5 11							
			11	Rigel	281 53.3 -8 14.9	30	18 19	19 45	2 58	3 33	4 12	4 55							
			38	Rigil Kent.	140 51.6 -60 39.3	35	18 26	19 58	2 57	3 29	4 05	4 46							
			44	Sabik	103 02.4 -15 40.3	40	18 34	20 15	2 56	3 25	3 58	4 36							
						45	18 44	20 38	2 54	3 20	3 50	4 24							
			45	Shaula	97 20.9 -37 04.5	50	18 55	21 08	2 53	3 15	3 39	4 09							
			18	Sirius	259 11.6 -16 39.1	52	19 01	21 25	2 52	3 12	3 35	4 03							
			33	Spica	159 17.1 -10 55.8	54	19 06	21 45	2 51	3 09	3 30	3 55							
			23	Suhail	223 24.4 -43 15.0	56	19 13	22 13	2 50	3 06	3 24	3 47							
						58	19 20	23 00	2 50	3 02	3 18	3 37							
			49	Vega	81 08.4 +38 44.8	60	19 29	23 00	2 48	2 59	3 11	3 27							
			39	Zub'g'bi	-137 53.6 -15 51.5	S													
			G M T	Equation of Time (App.—Mean)		GMT of Transit Meridian of Greenwich													
				28	29	30													
			h	m	s	m	s	m	s										
			0	+16 04.0	+16 09.2	+16 13.6													
			6	+16 05.4	+16 10.3	+16 14.5													
			12	+16 06.7	+16 11.5	+16 15.5													
			18	+16 07.9	+16 12.5	+16 16.4													
			24	+16 09.2	+16 13.6	+16 17.2													
			DAY	Moon	Venus	Mars	Jupiter	Saturn											
			h	m	s	h	m	s	h	m	s	h	m	s					
			28	21 39	12 43	10 13	7 37	12 54											
			29	22 30	12 44	10 11	7 34	12 51											
			30	23 24	12 46	10 10	7 30	12 47											
			31	24 22	12 47	10 08	7 27	12 44											
			Subtract from table, back cover																

G M T	VENUS - 3.3		MARS 2.0		JUPITER - 1.6		SATURN 0.7		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
31 0	38 31.4	168 30.2	-18 19.2	207 48.2	- 3 32.8	248 03.2	+12 52.9	168 37.1	-16 19.1	8 41.5	70	+16 02.7 +104
1	53 33.8	183 29.5	20.1	222 49.2	33.5	263 05.4	52.7	183 39.2	19.2	23 07.5	69	16 13.1 +103
2	68 36.3	198 28.9	21.0	237 50.2	34.1	278 07.5	52.6	198 41.4	19.3	37 33.4	68	16 23.4 +101
3	83 38.8	213 28.2	.. 21.9	252 51.1	.. 34.7	293 09.7	.. 52.5	213 43.6	.. 19.4	51 59.2	67	+16 33.5 +101
4	98 41.2	228 27.5	22.8	267 52.1	35.4	308 11.8	52.4	228 45.7	19.5	66 24.9	67	16 43.6 + 99
5	113 43.7	243 26.8	23.7	282 53.1	36.0	323 13.9	52.3	243 47.9	19.5	80 50.6	65	16 53.5 + 99
6	128 46.1	258 26.1	-18 24.6	297 54.1	- 3 36.6	338 16.1	+12 52.2	258 50.1	-16 19.6	95 16.1	65	+17 03.4 + 97
7	143 48.6	273 25.4	25.5	312 55.1	37.3	353 18.2	52.1	273 52.3	19.7	109 41.6	64	17 13.1 + 97
8	158 51.1	288 24.8	26.4	327 56.1	37.9	8 20.3	52.0	288 54.4	19.8	124 07.0	63	17 22.8 + 95
9	173 53.5	303 24.1	.. 27.2	342 57.1	.. 38.6	23 22.5	.. 51.9	303 56.6	.. 19.8	138 32.3	62	+17 32.3 + 94
10	188 56.0	318 23.4	28.1	357 58.0	39.2	38 24.6	51.8	318 58.8	19.9	152 57.5	61	17 41.7 + 94
11	203 58.5	333 22.7	29.0	12 59.0	39.8	53 26.8	51.7	334 00.9	20.0	167 22.6	60	17 51.1 + 92
12	219 00.9	348 22.0	-18 29.9	28 00.0	- 3 40.5	68 28.9	+12 51.6	349 03.1	-16 20.1	181 47.6	59	+18 00.3 + 90
13	234 03.4	3 21.3	30.8	43 01.0	41.1	83 31.0	51.4	4 05.3	20.2	196 12.5	59	18 09.3 + 90
14	249 05.9	18 20.6	31.7	58 02.0	41.7	98 33.2	51.3	19 07.4	20.2	210 37.4	57	18 18.3 + 89
15	264 08.3	33 19.9	.. 32.6	73 03.0	.. 42.4	113 35.3	.. 51.2	34 09.6	.. 20.3	225 02.1	57	+18 27.2 + 87
16	279 10.8	48 19.2	33.5	88 04.0	43.0	128 37.5	51.1	49 11.8	20.4	239 26.8	56	18 35.9 + 86
17	294 13.3	63 18.5	34.3	103 04.9	43.7	143 39.6	51.0	64 14.0	20.5	253 51.4	55	18 44.5 + 85
18	309 15.7	78 17.9	-18 35.2	118 05.9	- 3 44.3	158 41.7	+12 50.9	79 16.1	-16 20.5	268 15.9	54	+18 53.0 + 83
19	324 18.2	93 17.2	36.1	133 06.9	44.9	173 43.9	50.8	94 18.3	20.6	282 40.3	54	19 01.3 + 83
20	339 20.6	108 16.5	37.0	148 07.9	45.6	188 46.0	50.7	109 20.5	20.7	297 04.7	52	19 09.6 + 81
21	354 23.1	123 15.8	.. 37.9	163 08.9	.. 46.2	203 48.2	.. 50.6	124 22.6	.. 20.8	311 28.9	52	+19 17.7 + 79
22	9 25.6	138 15.1	38.7	178 09.9	46.8	218 50.3	50.5	139 24.8	20.9	325 53.1	51	19 25.6 + 79
23	24 28.0	153 14.4	39.6	193 10.9	47.5	233 52.4	50.4	154 27.0	20.9	340 17.2	51	19 33.5 + 77
1 0	39 30.5	168 13.7	-18 40.5	208 11.8	- 3 48.1	248 54.6	+12 50.3	169 29.2	-16 21.0	354 41.3	49	+19 41.2 + 76
1	54 33.0	183 13.0	41.4	223 12.8	48.8	263 56.7	50.2	184 31.3	21.1	9 05.2	49	19 48.8 + 74
2	69 35.4	198 12.3	42.3	238 13.8	49.4	278 58.9	50.0	199 33.5	21.2	23 29.1	48	19 56.2 + 73
3	84 37.9	213 11.6	.. 43.1	253 14.8	.. 50.0	294 01.0	.. 49.9	214 35.7	.. 21.2	37 52.9	47	+20 03.5 + 72
4	99 40.4	228 10.9	44.0	268 15.8	50.7	309 03.2	49.8	229 37.8	21.3	52 16.6	47	20 10.7 + 70
5	114 42.8	243 10.2	44.9	283 16.8	51.3	324 05.3	49.7	244 40.0	21.4	66 40.3	46	20 17.7 + 69
6	129 45.3	258 09.5	-18 45.7	298 17.8	- 3 51.9	339 07.4	+12 49.6	259 42.2	-16 21.5	81 03.9	45	+20 24.6 + 68
7	144 47.8	273 08.8	46.6	313 18.7	52.6	354 09.6	49.5	274 44.4	21.6	95 27.4	45	20 31.4 + 66
8	159 50.2	288 08.1	47.5	328 19.7	53.2	9 11.7	49.4	289 46.5	21.6	109 50.9	44	20 38.0 + 64
9	174 52.7	303 07.4	.. 48.4	343 20.7	.. 53.8	24 13.9	.. 49.3	304 48.7	.. 21.7	124 14.3	43	+20 44.4 + 63
10	189 55.1	318 06.7	49.2	358 21.7	54.5	39 16.0	49.2	319 50.9	21.8	138 37.6	43	20 50.7 + 62
11	204 57.6	333 06.0	50.1	13 22.7	55.1	54 18.2	49.1	334 53.0	21.9	153 00.9	42	20 56.9 + 60
12	220 00.1	348 05.3	-18 51.0	28 23.7	- 3 55.8	69 20.3	+12 49.0	349 55.2	-16 21.9	167 24.1	41	+21 02.9 + 59
13	235 02.5	3 04.6	51.8	43 24.6	56.4	84 22.4	48.9	4 57.4	22.0	181 47.2	41	21 08.8 + 57
14	250 05.0	18 03.9	52.7	58 25.6	57.0	99 24.6	48.8	19 59.5	22.1	196 10.3	40	21 14.5 + 55
15	265 07.5	33 03.2	.. 53.6	73 26.6	.. 57.7	114 26.7	.. 48.7	35 01.7	.. 22.2	210 33.3	40	+21 20.0 + 55
16	280 09.9	48 02.5	54.4	88 27.6	58.3	129 28.9	48.6	50 03.9	22.3	224 56.3	39	21 25.5 + 52
17	295 12.4	63 01.8	55.3	103 28.6	58.9	144 31.0	48.5	65 06.1	22.3	239 19.2	39	21 30.7 + 51
18	310 14.9	78 01.1	-18 56.2	118 29.6	- 3 59.6	159 33.2	+12 48.3	80 08.2	-16 22.4	253 42.1	38	+21 35.8 + 49
19	325 17.3	93 00.4	57.0	133 30.6	4 00.2	174 35.3	48.2	95 10.4	22.5	268 04.9	38	21 40.7 + 48
20	340 19.8	107 59.7	57.9	148 31.5	00.8	189 37.5	48.1	110 12.6	22.6	282 27.7	37	21 45.5 + 47
21	355 22.3	122 59.0	.. 58.7	163 32.5	.. 01.5	204 39.6	.. 48.0	125 14.7	.. 22.6	296 50.4	37	+21 50.2 + 44
22	10 24.7	137 58.3	18 59.6	178 33.5	02.1	219 41.8	47.9	140 16.9	22.7	311 13.1	36	21 54.6 + 43
23	25 27.2	152 57.6	19 00.4	193 34.5	02.7	234 43.9	47.8	155 19.1	22.8	325 35.7	36	21 58.9 + 42
2 0	40 29.6	167 56.9	-19 01.3	208 35.5	- 4 03.4	249 46.1	+12 47.7	170 21.3	-16 22.9	339 58.3	36	+22 03.1 + 40
1	55 32.1	182 56.2	02.2	223 36.5	04.0	264 48.2	47.6	185 23.4	23.0	354 20.9	35	22 07.1 + 38
2	70 34.6	197 55.4	03.0	238 37.4	04.7	279 50.3	47.5	200 25.6	23.0	8 43.4	35	22 10.9 + 37
3	85 37.0	212 54.7	.. 03.9	253 38.4	.. 05.3	294 52.5	.. 47.4	215 27.8	.. 23.1	23 05.9	34	+22 14.6 + 35
4	100 39.5	227 54.0	04.7	268 39.4	05.9	309 54.6	47.3	230 29.9	23.2	37 28.3	35	22 18.1 + 33
5	115 42.0	242 53.3	05.6	283 40.4	06.6	324 56.8	47.2	245 32.1	23.3	51 50.8	34	22 21.4 + 32
6	130 44.4	257 52.6	-19 06.4	298 41.4	- 4 07.2	339 58.9	+12 47.1	260 34.3	-16 23.3	66 13.2	33	+22 24.6 + 30
7	145 46.9	272 51.9	07.3	313 42.4	07.8	355 01.1	47.0	275 36.4	23.4	80 35.5	34	22 27.6 + 28
8	160 49.4	287 51.2	08.1	328 43.3	08.5	10 03.2	46.9	290 38.6	23.5	94 57.9	33	22 30.4 + 27
9	175 51.8	302 50.5	.. 09.0	343 44.3	.. 09.1	25 05.4	.. 46.8	305 40.8	.. 23.6	109 20.2	33	+22 33.1 + 25
10	190 54.3	317 49.8	09.8	358 45.3	09.7	40 07.5	46.7	320 42.9	23.7	123 42.5	33	22 35.6 + 24
11	205 56.7	332 49.0	10.7	13 46.3	10.4	55 09.7	46.6	335 45.1	23.7	138 04.8	33	22 38.0 + 21
12	220 59.2	347 48.3	-19 11.5	28 47.3	- 4 11.0	70 11.8	+12 46.5	350 47.3	-16 23.8	152 27.1	33	+22 40.1 + 20
13	236 01.7	2 47.6	12.4	43 48.3	11.6	85 14.0	46.4	5 49.5	23.9	166 49.4	32	22 42.1 + 19
14	251 04.1	17 46.9	13.2	58 49.2	12.3	100 16.1	46.2	20 51.6	24.0	181 11.6	33	22 44.0 + 16
15	266 06.6	32 46.2	.. 14.0	73 50.2	.. 12.9	115 18.3	.. 46.1	35 53.8	.. 24.0	195 33.9	32	+22 45.6 + 15
16	281 09.1	47 45.5	14.9	88 51.2	13.5	130 20.4	46.0	50 56.0	24.1	209 56.1	33	22 47.1 + 14
17	296 11.5	62 44.7	15.7	103 52.2	14.2	145 22.6	45.9	65 58.1	24.2	224 18.4	32	22 48.5 + 11
18	311 14.0	77 44.0	-19 16.6	118 53.2	- 4 14.8	160 24.7	+12 45.8	81 00.3	-16 24.3	238 40.6	32	+22 49.6 + 10
19	326 16.5	92 43.3	17.4	133 54.2	15.4	175 26.9	45.7	96 02.5	24.4	253 02.8	33	22 50.6 + 8
20	341 18.9	107 42.6	18.3	148 55.1	16.1	190 29.0	45.6	111 04.6	24.4	267 25.1	32	22 51.4 + 7
21	356 21.4	122 41.9	.. 19.1	163 56.1	.. 16.7	205 31.2	.. 45.5	126 06.8	.. 24.5	281 47.3	33	+22 52.1 + 5
22	11 23.9	137 41.2	19.9	178 57.1	17.4	220 33.3	45.4	141 09.0	24.6	296 09.6	32	22 52.6 + 3
23	26 26.3	152 40.4	20.8	193 58.1	18.0	235 35.5	45.3	156 11.1	24.7	310 31.8	33	22 52.9 + 2
24	41 28.8	167 39.7	-19 21.6	208 59.1	- 4 18.6	250 37.7	+12 45.2	171 13.3	-16 24.7	324 54.1	33	+22 53.1 - 1
code	-	- 7	- 8	+ 9	- 6	+ 21	- 1	+ 22	- 1			

G M T	SUN		STARS			Lat.	Sunrise	Twilt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS				
	GHA	Dec.	No.	Name	SHA				Dec.	31	1	2	3	Alt.	Sun's Low'r Limb	Venus	Mars
31	184 04.3	-13 47.0	7	Acamar	315 50.6	-40 28.7	72	8 52	4 42	12 18	□	□	□	Alt.	Sun's	Venus	Mars
1	199 04.4	47.8	5	Achernar	335 58.2	-57 27.6	70	8 27	4 46	13 41	□	□	□		Low'r		
2	214 04.4	48.7	30	Acruz	173 58.3	-62 51.2	68	8 08	4 50	14 21	14 05	□	□		Add	Add	Add
3	229 04.4	49.5	19	Adhara	255 46.3	-28 54.5	66	7 53	4 52	14 48	14 56	15 22	16 32	0	0.4	0.1	0.1
4	244 04.5	50.3	10	Aldebaran	291 38.7	+16 25.4	64	7 40	4 54	15 09	15 28	16 06	17 14	30	0.4	0.1	0.0
5	259 04.5	51.1					62	7 29	4 55	15 27	15 52	16 35	17 43	45	0.4	0.1	0.0
6	274 04.5	-13 51.9	32	Alioth	166 59.0	+56 11.8	60	7 20	4 56	15 41	16 11	16 58	18 05	60	0.4	0.0	0.0
7	289 04.5	52.8	34	Alkaid	153 33.3	+49 31.9	58	7 12	4 56	15 53	16 27	17 16	18 23	75	0.4	0.0	0.0
8	304 04.6	53.6	55	Al Na'ir	28 37.7	-47 10.6	56	7 05	4 57	16 04	16 41	17 31	18 38	90	0.4	0.0	0.0
9	319 04.6	54.4	15	Alnilam	276 30.0	-1 13.6	54	6 59	4 57	16 14	16 53	17 45	18 51				
10	334 04.6	55.2	25	Alphard	218 38.6	-8 27.9	52	6 54	4 58	16 22	17 03	17 56	19 02				
11	349 04.7	56.0					50	6 48	4 58	16 30	17 12	18 07	19 12				
12	4 04.7	-13 56.8	41	Alphecca	126 47.9	+26 51.8	45	6 37	4 57	16 46	17 32	18 28	19 33	Moon's Lower Limb			
13	19 04.7	57.7	1	Alpheratz	358 28.0	+28 51.1	40	6 28	4 56	16 59	17 48	18 45	19 50	Add			
14	34 04.8	58.5	51	Altair	62 50.4	+8 45.2	35	6 20	4 54	17 11	18 02	19 00	20 05	Alt.	31	1	2
15	49 04.8	-13 59.3	2	Ankaa	353 57.8	-42 32.7	30	6 13	4 52	17 21	18 14	19 13	20 17	0	19.6	20.0	20.1
16	64 04.8	14 00.1	42	Antares	113 19.6	-26 20.1	20	6 01	4 46	17 38	18 34	19 35	20 38	8	19.6	20.0	20.1
17	79 04.8	00.9					10	5 50	4 39	17 54	18 52	19 54	20 57	12	19.5	19.9	20.0
18	94 04.9	-14 01.7	37	Arcturus	146 35.5	+19 24.7	0	5 40	4 29	18 08	19 09	20 12	21 14	16	19.5	19.8	20.0
19	109 04.9	02.5	43	Atria	109 00.7	-68 57.1	10	5 30	4 17	18 22	19 26	20 29	21 31	20	19.4	19.8	19.9
20	124 04.9	03.3	22	Avior	234 35.7	-59 21.8	20	5 19	4 02	18 38	19 44	20 49	21 50	24	19.3	19.6	19.8
21	139 05.0	04.2	13	Bellatrix	279 18.1	+6 18.8	30	5 06	3 41	18 56	20 05	21 11	22 11	32	19.2	19.5	19.7
22	154 05.0	05.0	16	Betelge'se	271 47.8	+7 24.1	35	4 59	3 27	19 06	20 17	21 24	22 24	36	19.1	19.4	19.5
23	169 05.0	05.8					40	4 50	3 09	19 19	20 31	21 38	22 38	44	18.8	19.1	19.2
			17	Canopus	264 15.0	-52 40.0	45	4 40	2 47	19 33	20 48	21 56	22 55	48	18.6	18.9	19.0
1	184 05.0	-14 06.6	12	Capella	281 37.9	+45 57.2	50	4 28	2 15	19 50	21 08	22 18	23 16	52	18.3	18.6	18.6
2	199 05.1	07.4	53	Deneb	50 01.0	+45 07.7	52	4 22	1 57	19 59	21 18	22 29	23 26	56	18.1	18.4	18.4
3	214 05.1	08.2	28	Denebola	183 17.9	+14 49.1	54	4 16	1 35	20 08	21 30	22 41	23 37	60	17.9	18.1	18.2
4	229 05.1	09.0	4	Diphda	349 38.9	-18 13.6	56	4 09	1 03	20 18	21 42	22 54	23 50	64	17.7	17.9	18.0
5	244 05.1	09.8					58	4 01	///	20 30	21 57	23 10	24 05	68	17.5	17.7	17.8
6	259 05.2	10.6	27	Dubhe	194 44.9	+61 59.1	60	3 52	///	20 44	22 15	23 29	24 22	72	17.3	17.5	17.5
7	274 05.2	-14 11.4	14	Elnath	279 07.0	+28 34.3	S				Moonset				Add to table, back cover		
8	289 05.2	12.3	47	Eltanin	91 06.6	+51 29.9	Lat.	Sunset	Twilt. ends	31	1	2	3	Alt.	31	1	2
9	304 05.2	13.1	54	Enif	34 29.4	+9 40.6											
10	319 05.2	13.9	56	Fomalhaut	16 11.3	-29 51.3	N.	h m	h m	h m	h m	h m	h m	72	17.1	17.2	17.3
11	334 05.3	14.7															
12	4 05.3	-14 16.3	31	Gacrux	172 49.7	-56 51.9	72	14 34	18 40	11 09	□	□	□	80	16.9	17.0	17.0
13	19 05.3	17.1	29	Gienah	176 37.1	-17 17.8	70	14 59	18 36	9 48	□	□	□	84	16.6	16.7	16.8
14	34 05.4	17.9	35	Hadar	149 50.0	-60 09.6	68	15 18	18 33	9 10	11 30	□	□	88	16.5	16.6	16.6
15	49 05.4	18.7	6	Hamal	328 49.2	+23 15.5	66	15 34	18 32	8 43	10 40	12 26	13 27	Moon's Upper Limb			
16	64 05.4	19.5	48	Kaus Aust.	84 41.3	-34 24.5	64	15 46	18 30	8 23	10 09	11 42	12 45	Subtract			
17	79 05.4	20.3					62	15 57	18 29	8 06	9 45	11 12	12 16	Alt.	31	1	2
18	94 05.4	-14 21.1	40	Kochab	137 19.1	+74 20.1	60	16 06	18 28	7 53	9 27	10 50	11 54	0	13.2	13.0	12.9
19	109 05.5	21.9	57	Markab	14 21.2	+14 58.3	58	16 14	18 28	7 41	9 11	10 32	11 36	4	13.2	13.0	13.0
20	124 05.5	22.7	8	Menkar	314 59.9	+3 55.2	56	16 21	18 28	7 31	8 58	10 17	11 21	8	13.3	13.1	13.0
21	139 05.5	23.5	36	Menkent	148 59.0	-36 09.2	54	16 27	18 27	7 22	8 47	10 04	11 08	12	13.3	13.1	13.0
22	154 05.5	24.3	24	Miap'dus	221 49.1	-69 31.9	52	16 33	18 27	7 14	8 36	9 52	10 56	16	13.4	13.2	13.1
23	169 05.5	25.1					50	16 38	18 27	7 07	8 27	9 42	10 46	24	13.5	13.3	13.2
			9	Mirfak	309 41.8	+49 42.4	45	16 49	18 28	6 52	8 08	9 21	10 25	28	13.6	13.5	13.4
1	184 05.5	-14 25.9	50	Nunki	76 52.0	-26 21.2	40	16 59	18 31	6 40	7 53	9 03	10 07	32	13.8	13.6	13.5
2	199 05.6	26.7	52	Peacock	54 27.2	-56 52.8	35	17 07	18 33	6 29	7 40	8 49	9 53	36	13.9	13.7	13.7
3	214 05.6	27.5	21	Pollux	244 20.4	+28 08.0	30	17 14	18 35	6 20	7 29	8 36	9 40	40	14.0	13.9	13.9
4	229 05.6	28.3	20	Procyon	245 44.8	+5 20.4	20	17 26	18 41	6 04	7 09	8 15	9 18	44	14.2	14.1	14.0
5	244 05.6	29.1					10	17 37	18 49	5 50	6 52	7 56	8 59	48	14.4	14.3	14.2
6	259 05.6	29.9	46	R'alhague	96 46.8	+12 35.6	0	17 47	18 58	5 37	6 37	7 39	8 41	52	14.5	14.4	14.4
7	274 05.6	-14 30.7	26	Regulus	208 29.6	+12 11.0	10	17 57	19 10	5 25	6 21	7 21	8 24	56	14.7	14.6	14.6
8	289 05.7	31.5	11	Rigel	281 53.3	-8 14.9	20	18 09	19 26	5 11	6 04	7 02	8 05	60	14.9	14.9	14.8
9	304 05.7	32.3	38	Rigel Kent.	140 51.6	-60 39.3	30	18 22	19 48	4 55	5 45	6 41	7 43	64	15.1	15.1	15.1
10	319 05.7	33.1	44	Sabik	103 02.4	-15 40.3	35	18 29	20 02	4 46	5 34	6 28	7 30	68	15.3	15.3	15.3
11	334 05.7	33.9					40	18 38	20 20	4 36	5 21	6 14	7 15	72	15.5	15.5	15.5
12	4 05.7	-14 35.5	3	Schedar	350 29.4	+56 18.0	45	18 48	20 44	4 24	5 06	5 56	6 57	76	15.8	15.8	15.8
13	19 05.7	36.3	45	Shaula	97 20.9	-37 04.4	50	19 00	21 17	4 09	4 47	5 35	6 35	80	16.0	16.0	16.0
14	34 05.8	37.1	18	Sirius	259 11.6	-16 39.1	52	19 06	21 35	4 03	4 38	5 25	6 25	84	16.2	16.3	16.3
15	49 05.8	37.9	33	Spica	159 17.1	-10 55.8	54	19 12	21 58	3 55	4 29	5 14	6 13	88	16.4	16.4	16.5
16	64 05.8	38.7	23	Suhail	223 24.3	-43 15.0	56	19 19	22 31	3 47	4 18	5 01	5 59	90			
17	79 05.8	39.5					58	19 27	///	3 37	4 05	4 46	5 43				
18	94 05.8	-14 40.3	49	Vega	81 08.4	+38 44.8	60	19 37	///	3 27	3 51	4 28	5 24				
19	109 05.8	41.1	39	Zub'g'bi	137 53.6	-15 51.5	S				GMT of Transit				Subtract from table, back cover		
20	124 05.8	41.9	Equation of Time (App.—Mean)				Meridian of Greenwich										
21	139 05.8	42.7															
22	154 05.8	43.5															
23	169 05.9	44.2															
24	184 05.9	-14 45.0															
			G M T	Equation of Time (App.—Mean)			GMT of Transit										
				31	1	2	Meridian of Greenwich										
	</																

G M T	VENUS -3.3		MARS 2.0		JUPITER -1.6		SATURN 0.7		MOON		
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec. code
3 0	41 28.8	167 39.7 -19 21.6	208 59.1 - 4 18.6	250 37.7 +12 45.2	171 13.3 -16 24.7	324 54.1 33 +22 53.1 - 1					
1	56 31.2	182 39.0 22.4	224 00.1 19.3	265 39.8 45.1	186 15.5 24.8	339 16.4 33 22 53.0 - 1					
2	71 33.7	197 38.3 23.3	239 01.0 19.9	280 42.0 45.0	201 17.7 24.9	353 38.7 33 22 52.9 - 4					
3	86 36.2	212 37.5 .. 24.1	254 02.0 .. 20.5	295 44.1 .. 44.9	216 19.8 .. 25.0	8 01.0 33 -22 52.5 - 5					
4	101 38.6	227 36.8 24.9	269 03.0 21.2	310 46.3 44.8	231 22.0 25.1	22 23.3 34 22 52.0 - 7					
5	116 41.1	242 36.1 25.8	284 04.0 21.8	325 48.4 44.7	246 24.2 25.1	36 45.7 34 22 51.3 - 9					
6	131 43.6	257 35.4 -19 26.6	299 05.0 - 4 22.4	340 50.6 +12 44.6	261 26.3 -16 25.2	51 08.1 34 +22 50.4 - 10					
7	146 46.0	272 34.6 27.4	314 05.9 23.1	355 52.7 44.5	276 28.5 25.3	65 30.5 35 22 49.4 - 12					
8	161 48.5	287 33.9 28.2	329 06.9 23.7	10 54.9 44.4	291 30.7 25.4	79 53.0 34 22 48.2 - 13					
9	176 51.0	302 33.2 .. 29.1	344 07.9 .. 24.3	25 57.0 .. 44.3	306 32.8 .. 25.4	94 15.4 35 -22 46.9 - 16					
10	191 53.4	317 32.5 29.9	359 08.9 25.0	40 59.2 44.2	321 35.0 25.5	108 37.9 36 22 45.3 - 17					
11	206 55.9	332 31.7 30.7	14 09.9 25.6	56 01.3 44.1	336 37.2 25.6	123 00.5 36 22 43.6 - 18					
12	221 58.4	347 31.0 -19 31.6	29 10.9 - 4 26.2	71 03.5 +12 44.0	351 39.3 -16 25.7	137 23.1 36 +22 41.8 - 20					
13	237 00.8	2 30.3 32.4	44 11.8 26.9	86 05.7 43.9	6 41.5 25.8	151 45.7 37 22 39.8 - 22					
14	252 03.3	17 29.6 33.2	59 12.8 27.5	101 07.8 43.8	21 43.7 25.8	166 08.4 37 22 37.6 - 23					
15	267 05.7	32 28.8 .. 34.0	74 13.8 .. 28.1	116 10.0 .. 43.7	36 45.9 .. 25.9	180 31.1 37 -22 35.3 - 25					
16	282 08.2	47 28.1 34.8	89 14.8 28.8	131 12.1 43.6	51 48.0 26.0	194 53.8 38 22 32.8 - 27					
17	297 10.7	62 27.4 35.7	104 15.8 29.4	146 14.3 43.5	66 50.2 26.1	209 16.6 39 22 30.1 - 28					
18	312 13.1	77 26.6 -19 36.5	119 16.7 - 4 30.0	161 16.4 +12 43.4	81 52.4 -16 26.1	223 39.5 39 +22 27.3 - 30					
19	327 15.6	92 25.9 37.3	134 17.7 30.7	176 18.6 43.3	96 54.5 26.2	238 02.4 39 22 24.3 - 32					
20	342 18.1	107 25.2 38.1	149 18.7 31.3	191 20.7 43.2	111 56.7 26.3	252 25.3 40 22 21.1 - 33					
21	357 20.5	122 24.5 .. 38.9	164 19.7 .. 31.9	206 22.9 .. 43.1	126 58.9 .. 26.4	266 48.3 41 -22 17.8 - 34					
22	12 23.0	137 23.7 39.7	179 20.7 32.6	221 25.1 43.0	142 01.0 26.4	281 11.4 42 22 14.4 - 36					
23	27 25.5	152 23.0 40.6	194 21.7 33.2	236 27.2 42.9	157 03.2 26.5	295 34.5 42 22 10.8 - 38					
4 0	42 27.9	167 22.3 -19 41.4	209 22.6 - 4 33.8	251 29.4 +12 42.7	172 05.4 -16 26.6	309 57.7 42 +22 07.0 - 39					
1	57 30.4	182 21.5 42.2	224 23.6 34.5	266 31.5 42.6	187 07.5 26.7	324 20.9 43 22 03.1 - 41					
2	72 32.8	197 20.8 43.0	239 24.6 35.1	281 33.7 42.5	202 09.7 26.8	338 44.2 44 21 59.0 - 42					
3	87 35.3	212 20.0 .. 43.8	254 25.6 .. 35.7	296 35.8 .. 42.4	217 11.9 .. 26.8	353 07.6 44 21 54.8 - 44					
4	102 37.8	227 19.3 44.6	269 26.6 36.4	311 38.0 42.3	232 14.0 26.9	7 31.0 45 21 50.4 - 45					
5	117 40.2	242 18.6 45.4	284 27.5 37.0	326 40.2 42.2	247 16.2 27.0	21 54.5 46 21 45.9 - 47					
6	132 42.7	257 17.8 -19 46.2	299 28.5 - 4 37.6	341 42.3 +12 42.1	262 18.4 -16 27.1	36 18.1 46 +21 41.2 - 48					
7	147 45.2	272 17.1 47.0	314 29.5 38.3	356 44.5 42.0	277 20.5 27.1	50 41.7 47 21 36.4 - 50					
8	162 47.6	287 16.4 47.8	329 30.5 38.9	11 46.6 41.9	292 22.7 27.2	65 05.4 48 21 31.4 - 51					
9	177 50.1	302 15.6 .. 48.6	344 31.5 .. 39.5	26 48.8 .. 41.8	307 24.9 .. 27.3	79 29.2 49 21 26.3 - 53					
10	192 52.6	317 14.9 49.4	359 32.4 40.2	41 51.0 41.7	322 27.0 27.4	93 53.1 49 21 21.0 - 54					
11	207 55.0	332 14.1 50.3	14 33.4 40.8	56 53.1 41.6	337 29.2 27.5	108 17.0 50 21 15.6 - 55					
12	222 57.5	347 13.4 -19 51.1	29 34.4 - 4 41.4	71 55.3 +12 41.5	352 31.4 -16 27.5	122 41.0 51 +21 10.1 - 57					
13	238 00.0	2 12.7 51.9	44 35.4 42.1	86 57.4 41.4	7 33.6 27.6	137 05.1 51 21 04.4 - 58					
14	253 02.4	17 11.9 52.7	59 36.4 42.7	101 59.6 41.3	22 35.7 27.7	151 29.2 53 20 58.6 - 60					
15	268 04.9	32 11.2 .. 53.5	74 37.3 .. 43.3	117 01.8 .. 41.2	37 37.9 .. 27.8	165 53.5 53 20 52.6 - 61					
16	283 07.3	47 10.4 54.3	89 38.3 44.0	132 03.9 41.1	52 40.1 27.8	180 17.8 54 20 46.5 - 62					
17	298 09.8	62 09.7 55.0	104 39.3 44.6	147 06.1 41.0	67 42.2 27.9	194 42.2 55 20 40.3 - 64					
18	313 12.3	77 09.0 -19 55.8	119 40.3 - 4 45.2	162 08.3 +12 40.9	82 44.4 -16 28.0	209 06.7 56 +20 33.9 - 65					
19	328 14.7	92 08.2 56.6	134 41.3 45.9	177 10.4 40.8	97 46.6 28.1	223 31.3 56 20 27.4 - 66					
20	343 17.2	107 07.5 57.4	149 42.2 46.5	192 12.6 40.7	112 48.7 28.2	237 55.9 58 20 20.8 - 68					
21	358 19.7	122 06.7 .. 58.2	164 43.2 .. 47.1	207 14.7 .. 40.6	127 50.9 .. 28.2	252 20.7 58 20 14.0 - 69					
22	13 22.1	137 06.0 59.0	179 44.2 47.8	222 16.9 40.5	142 53.1 28.3	266 45.5 59 20 07.1 - 70					
23	28 24.6	152 05.2 19 59.8	194 45.2 48.4	237 19.1 40.4	157 55.2 28.4	281 10.4 60 20 00.1 - 72					
5 0	43 27.1	167 04.5 -20 00.6	209 46.2 - 4 49.0	252 21.2 +12 40.3	172 57.4 -16 28.5	295 35.4 61 +19 52.9 - 72					
1	58 29.5	182 03.7 01.4	224 47.1 49.7	267 23.4 40.2	187 59.6 28.5	310 00.5 62 19 45.7 - 74					
2	73 32.0	197 03.0 02.2	239 48.1 50.3	282 25.6 40.1	203 01.7 28.6	324 25.7 62 19 38.3 - 75					
3	88 34.4	212 02.2 .. 03.0	254 49.1 .. 50.9	297 27.7 .. 40.0	218 03.9 .. 28.7	338 50.9 64 19 30.8 - 77					
4	103 36.9	227 01.5 03.8	269 50.1 51.6	312 29.9 39.9	233 06.1 28.8	353 16.3 64 19 23.1 - 77					
5	118 39.4	242 00.7 04.5	284 51.0 52.2	327 32.0 39.8	248 08.2 28.8	7 41.7 66 19 15.4 - 79					
6	133 41.8	257 00.0 -20 05.3	299 52.0 - 4 52.8	342 34.2 +12 39.7	263 10.4 -16 28.9	22 07.3 66 +19 07.5 - 80					
7	148 44.3	271 59.2 06.1	314 53.0 53.4	357 36.4 39.6	278 12.6 29.0	36 32.9 67 18 59.5 - 81					
8	163 46.8	286 58.5 06.9	329 54.0 54.1	12 38.5 39.5	293 14.7 29.1	50 58.6 68 18 51.4 - 82					
9	178 49.2	301 57.7 .. 07.7	344 55.0 .. 54.7	27 40.7 .. 39.4	308 16.9 .. 29.2	65 24.4 69 18 43.2 - 83					
10	193 51.7	316 57.0 08.5	359 55.9 55.3	42 42.9 39.3	323 19.1 29.2	79 50.3 70 18 34.9 - 84					
11	208 54.2	331 56.2 09.2	14 56.9 56.0	57 45.0 39.2	338 21.2 29.3	94 16.3 71 18 26.5 - 86					
12	223 56.6	346 55.5 -20 10.0	29 57.9 - 4 56.6	72 47.2 +12 39.1	353 23.4 -16 29.4	108 42.4 72 +18 17.9 - 86					
13	238 59.1	1 54.7 10.8	44 58.9 57.2	87 49.4 39.0	8 25.6 29.5	123 08.6 73 18 09.3 - 88					
14	254 01.6	16 54.0 11.6	59 59.9 57.9	102 51.5 38.9	23 27.7 29.5	137 34.9 73 18 00.5 - 88					
15	269 04.0	31 53.2 .. 12.3	75 00.8 .. 58.5	117 53.7 .. 38.8	38 29.9 .. 29.6	152 01.2 75 17 51.7 - 90					
16	284 06.5	46 52.5 13.1	90 01.8 59.1	132 55.9 38.8	53 32.1 29.7	166 27.7 75 17 42.7 - 91					
17	299 08.9	61 51.7 13.9	105 02.8 59.8	147 58.0 38.7	68 34.2 29.8	180 54.2 77 17 33.6 - 91					
18	314 11.4	76 51.0 -20 14.7	120 03.8 - 5 00.4	163 00.2 +12 38.6	83 36.4 -16 29.9	195 20.9 77 +17 24.5 - 93					
19	329 13.9	91 50.2 15.4	135 04.7 01.0	178 02.4 38.5	98 38.6 29.9	209 47.6 78 17 15.2 - 93					
20	344 16.3	106 49.4 16.2	150 05.7 01.7	193 04.5 38.4	113 40.7 30.0	224 14.4 80 17 05.9 - 95					
21	359 18.8	121 48.7 .. 17.0	165 06.7 .. 02.3	208 06.7 .. 38.3	128 42.9 .. 30.1	238 41.4 80 16 56.4 - 95					
22	14 21.3	136 47.9 17.8	180 07.7 02.9	223 08.9 38.2	143 45.1 30.2	253 08.4 81 16 46.9 - 97					
23	29 23.7	151 47.2 18.5	195 08.7 03.5	238 11.0 38.1	158 47.2 30.2	267 35.5 82 16 37.2 - 97					
24	44 26.2	166 46.4 -20 19.3	210 09.6 - 5 04.2	253 13.2 +12 38.0	173 49.4 -16 30.3	282 02.7 83 +16 27.5 - 98					
code	-	- 7 - 8	+ 10 - 7	+ 21 - 1	+ 22 - 1						

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS						
	GHA	Dec.	No.	Name	SHA	Dec.								Sun's Low'r Limb Add	Venus Add	Mars Add				
										3	4	5	6							
h	°	'		°	'		N	h	m	h	m	h	m	h	m	Alt.				
3 0	184 05.9	-14 45.0	7	Acamar	315 50.6	-40 28.7	72	9 12	4 54	□	□	18 08	21 03							
1	199 05.9	45.8	5	Achernar	335 58.2	-57 27.6	70	8 42	4 56	□	□	19 11	21 27							
2	214 05.9	46.6	30	Acchuz	173 58.3	-62 51.2	68	8 20	4 58	□	17 33	19 46	21 45							
3	229 05.9	47.4	19	Adhara	255 46.3	-28 54.5	66	8 03	5 00	16 32	18 18	20 11	22 00							
4	244 05.9	48.2	10	Aldebaran	291 38.7	+16 25.4	64	7 50	5 01	17 14	18 48	20 31	22 12							
5	259 05.9	49.0					62	7 38	5 02	17 43	19 10	20 46	22 22							
6	274 05.9	-14 49.8	32	Alioth	166 59.0	+56 11.8	60	7 28	5 02	18 05	19 28	20 59	22 31							
7	289 05.9	50.6	34	Alkaid	153 33.3	+49 31.9	58	7 19	5 02	18 23	19 43	21 11	22 38							
8	304 05.9	51.4	55	Al Na'ir	28 37.7	-47 10.6	56	7 12	5 03	18 38	19 56	21 22	22 45							
9	319 05.9	52.1	15	Alnilam	276 29.9	-1 13.6	54	7 05	5 02	18 51	20 07	21 29	22 51							
10	334 05.9	52.9	25	Alphard	218 38.6	-8 27.9	52	6 59	5 02	19 02	20 17	21 37	22 56							
11	349 05.9	53.7					50	6 53	5 02	19 12	20 26	21 44	23 01							
12	4 05.9	-14 54.5	41	Alphecca	126 47.9	+26 51.8	45	6 42	5 00	19 33	20 44	21 58	23 11							
13	19 05.9	55.3	1	Alpheratz	358 28.0	+28 51.1	40	6 32	4 58	19 50	20 59	22 10	23 20							
14	34 05.9	56.1	51	Altair	62 50.5	-8 45.2	35	6 23	4 56	20 05	21 12	22 20	23 27							
15	49 06.0	56.9	2	Ankaa	353 57.9	-42 32.7	30	6 16	4 54	20 17	21 23	22 29	23 34							
16	64 06.0	57.6	42	Antares	113 19.6	-26 20.1	20	6 03	4 47	20 38	21 42	22 45	23 45							
17	79 06.0	58.4					10	5 51	4 39	20 57	21 59	22 58	23 54							
18	94 06.0	-14 59.2	37	Arcturus	146 35.4	+19 24.7	0	5 40	4 29	21 14	22 14	23 11	24 03							
19	109 06.0	15 00.0	43	Atria	109 00.7	-68 57.1	10	5 29	4 16	21 31	22 30	23 23	24 12							
20	124 06.0	00.8	22	Avior	234 35.7	-59 21.8	20	5 17	4 00	21 50	22 46	23 37	24 22							
21	139 06.0	01.6	13	Bellatrix	279 18.1	+6 18.7	30	5 03	3 37	22 11	23 05	23 52	24 33							
22	154 06.0	02.3	16	Betelgeuse	271 47.8	+7 24.1	35	4 56	3 22	22 24	23 16	24 00	0 00							
23	169 06.0	03.1					40	4 46	3 04	22 38	23 28	24 10	0 10							
			17	Canopus	264 15.0	-52 40.0	45	4 36	2 40	22 55	23 43	24 22	0 22							
			12	Capella	281 37.9	+45 57.3	50	4 23	2 05	23 16	24 01	0 01	0 36							
			53	Deneb	50 01.0	+45 07.7	52	4 16	1 45	23 26	24 09	0 09	0 43							
			28	Denebola	183 17.9	+14 49.1	54	4 10	1 20	23 37	24 19	0 19	0 50							
			4	Diphda	349 38.9	-18 13.6	56	4 02	0 39	23 50	24 29	0 29	0 58							
							58	3 54	///	24 05	0 05	0 41	1 07							
			27	Dubhe	194 44.8	+61 59.1	60	3 44	///	24 22	0 22	0 55	1 17							
			14	Elnath	279 06.9	+28 34.3	S													
			47	Eltanin	91 06.6	+51 29.9														
			54	Enif	34 29.5	+9 40.6														
			56	Fomalhaut	16 11.3	-29 51.4														
			31	Gacrux	172 49.6	-56 51.8														
			29	Gienah	176 37.0	-17 17.8														
			35	Hadar	149 50.0	-60 09.6														
			6	Hamal	328 49.2	+23 15.5														
			48	Kaus Aust.	84 41.3	-34 24.5														
			40	Kochab	137 19.1	+74 20.1														
			57	Markab	14 21.2	+14 58.1														
			8	Menkar	314 59.9	+3 55.2														
			36	Menkent	148 59.0	-36 09.2														
			24	Miapl'dus	221 49.1	-69 31.9														
			9	Mirfak	309 41.8	+49 42.4														
			50	Nunki	76 52.0	-26 21.2														
			52	Pecock	54 27.2	-56 52.8														
			21	Pollux	244 20.4	+28 07.9														
			20	Procyon	245 44.8	+5 20.4														
			46	R'alhague	96 46.8	+12 35.6														
			26	Regulus	208 29.5	+12 11.0														
			11	Rigel	281 53.3	-8 15.0														
			38	Rigel Kent.	140 51.5	-60 39.3														
			44	Sabik	103 02.4	-15 40.3														
			3	Schedar	350 29.4	+56 18.0														
			45	Shaula	97 20.9	-37 04.4														
			18	Sirius	259 11.6	-16 39.1														
			33	Spica	159 17.1	-10 55.8														
			23	Suhail	223 24.3	-43 15.0														
			49	Vega	81 08.5	+38 44.8														
			39	Zub'g'bi	137 53.6	-15 51.5														
			G M T	Equation of Time (App. - Mean)				GMT of Transit Meridian of Greenwich												
				3	4	5														
			h	m	s	m	s	m	s	DAY	Moon	Venus	Mars	Jupiter	Saturn					
			0	+16 23.4	+16 23.9	+16 23.5					h	m	h	m	h	m				
			6	+16 23.6	+16 23.8	+16 23.3		3	2 27	12 50	10 03	7 16	12 33							
			12	+16 23.7	+16 23.8	+16 23.0		4	3 29	12 51	10 02	7 13	12 30							
			18	+16 23.8	+16 23.7	+16 22.6		5	4 28	12 52	10 00	7 10	12 26							
			24	+16 23.9	+16 23.5	+16 22.3		6	5 24	12 54	9 59	7 06	12 23							
code	-	-	7													Subtract from table, back cover				

G M T	VENUS — 3.3		MARS 2.0		JUPITER — 1.6		SATURN 0.7		MOON		
	GHA	GHA Dec.	GHA Dec.	GHA Dec.	GHA Dec.	GHA Dec.	GHA code Dec. code				
6	h	o	o	o	o	o	o	o	o	o	o
	0	44 26.2	166 46.4 -20 19.3	210 09.6 - 5 04.2	253 13.2 +12 38.0	173 49.4 -16 30.3	282 02.7 83 +16 27.5 - 98				
	1	59 28.7	181 45.6 20.1	225 10.6 04.8	268 15.4 37.9	188 51.6 30.4	296 30.0 83 16 17.7 - 99				
	2	74 31.1	196 44.9 20.8	240 11.6 05.4	283 17.6 37.8	203 53.7 30.5	310 57.3 85 16 07.8 -100				
	3	89 33.6	211 44.1 .. 21.6	255 12.6 .. 06.1	298 19.7 .. 37.7	218 55.9 .. 30.5	325 24.8 86 +15 57.8 -101				
	4	104 36.1	226 43.4 22.3	270 13.5 06.7	313 21.9 37.6	233 58.1 30.6	339 52.4 86 15 47.7 -101				
	5	119 38.5	241 42.6 23.1	285 14.5 07.3	328 24.1 37.5	249 00.2 30.7	354 20.0 88 15 37.6 -103				
	6	134 41.0	256 41.8 -20 23.9	300 15.5 - 5 08.0	343 26.2 +12 37.4	264 02.4 -16 30.8	8 47.8 88 +15 27.3 -103				
	7	149 43.4	271 41.1 24.6	315 16.5 08.6	358 28.4 37.3	279 04.6 30.9	23 15.6 89 15 17.0 -104				
	8	164 45.9	286 40.3 25.4	330 17.5 09.2	13 30.6 37.2	294 06.7 30.9	37 43.5 90 15 06.6 -105				
	9	179 48.4	301 39.6 .. 26.2	345 18.4 .. 09.9	28 32.7 .. 37.1	309 08.9 .. 31.0	52 11.5 91 +14 56.1 -105				
	10	194 50.8	316 38.8 26.9	0 19.4 10.5	43 34.9 37.0	324 11.1 31.1	66 39.6 92 14 45.6 -106				
	11	209 53.3	331 38.0 27.7	15 20.4 11.1	58 37.1 36.9	339 13.2 31.2	81 07.8 93 14 35.0 -107				
	12	224 55.8	346 37.3 -20 28.4	30 21.4 - 5 11.7	73 39.3 +12 36.8	354 15.4 -16 31.2	95 36.1 94 +14 24.3 -108				
	13	239 58.2	1 36.5 29.2	45 22.3 12.4	88 41.4 36.7	9 17.6 31.3	110 04.5 94 14 13.5 -108				
	14	255 00.7	16 35.7 29.9	60 23.3 13.0	103 43.6 36.6	24 19.7 31.4	124 32.9 95 14 02.7 -110				
	15	270 03.2	31 35.0 .. 30.7	75 24.3 .. 13.6	118 45.8 .. 36.5	39 21.9 .. 31.5	139 01.4 97 +13 51.7 -109				
	16	285 05.6	46 34.2 31.4	90 25.3 14.3	133 47.9 36.4	54 24.1 31.6	153 30.1 97 13 40.8 -111				
	17	300 08.1	61 33.4 32.2	105 26.2 14.9	148 50.1 36.3	69 26.2 31.6	167 58.8 97 13 29.7 -111				
	18	315 10.6	76 32.6 -20 32.9	120 27.2 - 5 15.5	163 52.3 +12 36.2	84 28.4 -16 31.7	182 27.5 99 +13 18.6 -112				
	19	330 13.0	91 31.9 33.7	135 28.2 16.2	178 54.5 36.1	99 30.6 31.8	196 56.4 100 13 07.4 -112				
	20	345 15.5	106 31.1 34.4	150 29.2 16.8	193 56.6 36.0	114 32.7 31.9	211 25.4 100 12 56.2 -113				
	21	0 17.9	121 30.3 .. 35.2	165 30.1 .. 17.4	208 58.8 .. 35.9	129 34.9 .. 31.9	225 54.4 101 +12 44.9 -113				
	22	15 20.4	136 29.6 35.9	180 31.1 18.0	224 01.0 35.8	144 37.1 32.0	240 23.5 102 12 33.6 -114				
23	30 22.9	151 28.8 36.7	195 32.1 18.7	239 03.2 35.7	159 39.2 32.1	254 52.7 103 12 22.2 -115					
7	0	45 25.3	166 28.0 -20 37.4	210 33.1 - 5 19.3	254 05.3 +12 35.6	174 41.4 -16 32.2	269 22.0 103 +12 10.7 -115				
	1	60 27.8	181 27.2 38.2	225 34.1 19.9	269 07.5 35.5	189 43.6 32.2	283 51.3 105 11 59.2 -116				
	2	75 30.3	196 26.5 38.9	240 35.0 20.6	284 09.7 35.5	204 45.7 32.3	298 20.8 105 11 47.6 -116				
	3	90 32.7	211 25.7 .. 39.6	255 36.0 .. 21.2	299 11.9 .. 35.4	219 47.9 .. 32.4	312 50.3 106 +11 36.0 -117				
	4	105 35.2	226 24.9 40.4	270 37.0 21.8	314 14.0 35.3	234 50.1 32.5	327 19.9 106 11 24.3 -117				
	5	120 37.7	241 24.2 41.1	285 38.0 22.5	329 16.2 35.2	249 52.2 32.6	341 49.5 107 11 12.6 -118				
	6	135 40.1	256 23.4 -20 41.9	300 38.9 - 5 23.1	344 18.4 +12 35.1	264 54.4 -16 32.6	356 19.2 109 +11 00.8 -118				
	7	150 42.6	271 22.6 42.6	315 39.9 23.7	359 20.6 35.0	279 56.6 32.7	10 49.1 108 10 49.0 -119				
	8	165 45.0	286 21.8 43.3	330 40.9 24.3	14 22.7 34.9	294 58.7 32.8	25 18.9 110 10 37.1 -119				
	9	180 47.5	301 21.0 .. 44.1	345 41.9 .. 25.0	29 24.9 .. 34.8	310 00.9 .. 32.9	39 48.9 110 +10 25.2 -120				
	10	195 50.0	316 20.3 44.8	0 42.8 25.6	44 27.1 34.7	325 03.1 32.9	54 18.9 111 10 13.2 -120				
	11	210 52.4	331 19.5 45.5	15 43.8 26.2	59 29.3 34.6	340 05.2 33.0	68 49.0 112 10 01.2 -120				
	12	225 54.9	346 18.7 -20 46.3	30 44.8 - 5 26.9	74 31.5 +12 34.5	355 07.4 -16 33.1	83 19.2 112 + 9 49.2 -121				
	13	240 57.4	1 17.9 47.0	45 45.8 27.5	89 33.6 34.4	10 09.6 33.2	97 49.4 113 9 37.1 -121				
	14	255 59.8	16 17.2 47.7	60 46.7 28.1	104 35.8 34.3	25 11.7 33.2	112 19.7 114 9 25.0 -122				
	15	271 02.3	31 16.4 .. 48.4	75 47.7 .. 28.7	119 38.0 .. 34.2	40 13.9 .. 33.3	126 50.1 114 + 9 12.8 -122				
	16	286 04.8	46 15.6 49.2	90 48.7 29.4	134 40.2 34.1	55 16.1 33.4	141 20.5 115 9 00.6 -122				
	17	301 07.2	61 14.8 49.9	105 49.7 30.0	149 42.3 34.0	70 18.2 33.5	155 51.0 116 8 48.4 -123				
	18	316 09.7	76 14.0 -20 50.6	120 50.6 - 5 30.6	164 44.5 +12 33.9	85 20.4 -16 33.6	170 21.6 116 + 8 36.1 -123				
	19	331 12.2	91 13.3 51.4	135 51.6 31.3	179 46.7 33.8	100 22.6 33.6	184 52.2 117 8 23.8 -123				
	20	346 14.6	106 12.5 52.1	150 52.6 31.9	194 48.9 33.7	115 24.7 33.7	199 22.9 118 8 11.5 -124				
	21	1 17.1	121 11.7 .. 52.8	165 53.6 .. 32.5	209 51.1 .. 33.7	130 26.9 .. 33.8	213 53.7 118 + 7 59.1 -124				
	22	16 19.5	136 10.9 53.5	180 54.5 33.1	224 53.2 33.6	145 29.1 33.9	228 24.5 119 7 46.7 -124				
	23	31 22.0	151 10.1 54.2	195 55.5 33.8	239 55.4 33.5	160 31.2 33.9	242 55.4 119 7 34.3 -124				
8	0	46 24.5	166 09.3 -20 55.0	210 56.5 - 5 34.4	254 57.6 +12 33.4	175 33.4 -16 34.0	257 26.3 120 + 7 21.9 -125				
	1	61 26.9	181 08.5 55.7	225 57.4 35.0	269 59.8 33.3	190 35.6 34.1	271 57.3 120 7 09.4 -125				
	2	76 29.4	196 07.8 56.4	240 58.4 35.7	285 02.0 33.2	205 37.7 34.2	286 28.3 121 6 56.9 -125				
	3	91 31.9	211 07.0 .. 57.1	255 59.4 .. 36.3	300 04.1 .. 33.1	220 39.9 .. 34.2	300 59.4 122 + 6 44.4 -125				
	4	106 34.3	226 06.2 57.8	271 00.4 36.9	315 06.3 33.0	235 42.0 34.3	315 30.6 122 6 31.9 -126				
	5	121 36.8	241 05.4 58.5	286 01.3 37.5	330 08.5 32.9	250 44.2 34.4	330 01.8 122 6 19.3 -126				
	6	136 39.3	256 04.6 -20 59.3	301 02.3 - 5 38.2	345 10.7 +12 32.8	265 46.4 -16 34.5	344 33.0 124 + 6 06.7 -126				
	7	151 41.7	271 03.8 21 00.0	316 03.3 38.8	0 12.9 32.7	280 48.5 34.6	359 04.4 123 5 54.1 -126				
	8	166 44.2	286 03.0 00.7	331 04.3 39.4	15 15.0 32.6	295 50.7 34.6	13 35.7 124 5 41.5 -126				
	9	181 46.7	301 02.2 .. 01.4	346 05.2 .. 40.0	30 17.2 .. 32.5	310 52.9 .. 34.7	28 07.1 125 + 5 28.9 -127				
	10	196 49.1	316 01.5 02.1	1 06.2 40.7	45 19.4 32.4	325 55.0 34.8	42 38.6 125 5 16.2 -126				
	11	211 51.6	331 00.7 02.8	16 07.2 41.3	60 21.6 32.3	340 57.2 34.9	57 10.1 126 5 03.6 -127				
	12	226 54.0	345 59.9 -21 03.5	31 08.2 - 5 41.9	75 23.8 +12 32.3	355 59.4 -16 34.9	71 41.7 126 + 4 50.9 -127				
	13	241 56.5	0 59.1 04.2	46 09.1 42.6	90 26.0 32.2	11 01.5 35.0	86 13.3 126 4 38.2 -127				
	14	256 59.0	15 58.3 04.9	61 10.1 43.2	105 28.1 32.1	26 03.7 35.1	100 44.9 127 4 25.5 -127				
	15	272 01.4	30 57.5 .. 05.6	76 11.1 .. 43.8	120 30.3 .. 32.0	41 05.9 .. 35.2	115 16.6 127 + 4 12.8 -127				
	16	287 03.9	45 56.7 06.3	91 12.0 44.4	135 32.5 31.9	56 08.0 35.2	129 48.3 128 4 00.1 -127				
	17	302 06.4	60 55.9 07.0	106 13.0 45.1	150 34.7 31.8	71 10.2 35.3	144 20.1 128 3 47.4 -128				
	18	317 08.8	75 55.1 -21 07.7	121 14.0 - 5 45.7	165 36.9 +12 31.7	86 12.4 -16 35.4	158 51.9 129 + 3 34.6 -127				
	19	332 11.3	90 54.3 08.4	136 15.0 46.3	180 39.1 31.6	101 14.5 35.5	173 23.8 129 3 21.9 -127				
	20	347 13.8	105 53.5 09.1	151 15.9 46.9	195 41.3 31.5	116 16.7 35.5	187 55.7 129 3 09.2 -128				
	21	2 16.2	120 52.7 .. 09.8	166 16.9 .. 47.6	210 43.4 .. 31.4	131 18.9 .. 35.6	202 27.6 130 + 2 56.4 -127				
	22	17 18.7	135 51.9 10.5	181 17.9 48.2	225 45.6 31.3	146 21.0 35.7	216 59.6 130 2 43.7 -128				
	23	32 21.1	150 51.1 11.2	196 18.9 48.8	240 47.8 31.2	161 23.2 35.8	231 31.6 130 2 30.9 -128				
24	47 23.6	165 50.4 -21 11.9	211 19.8 - 5 49.5	255 50.0 +12 31.1	176 25.4 -16 35.9	246 03.6 131 + 2 18.1 -127					
code	-	- 8 - 7 + 10 - 6 + 21 - 1 + 22 - 1									

G M T	SUN		STARS				Lat.	Sunrise	Twit. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS				
	GHA	Dec.	No.	Name	SHA	Dec.								Alt.	Sun's Lower Limb Add	Venus Add	Mars Add	
										6	7	8	9					
h	°	'					N	h m	h m	h m	h m	h m	h m					
6 0	184 05.6	-15 40.9	7	Acamar	315 50.6	-40 28.7	72	9 33	5 05	21 03	23 15	25 15	1 15					
1	199 05.5	41.7	5	Achernar	335 58.2	-57 27.6	70	8 58	5 07	21 27	23 26	25 17	1 17					
2	214 05.5	42.4	30	Acruz	173 58.3	-62 51.1	68	8 33	5 08	21 45	23 35	25 20	1 20					
3	229 05.5	43.2	19	Adhara	255 46.3	-28 54.5	66	8 14	5 09	22 00	23 43	25 21	1 21					
4	244 05.5	43.9	10	Aldebaran	291 38.6	+16 25.4	64	7 59	5 09	22 12	23 49	25 23	1 23					
5	259 05.5	44.7					62	7 47	5 09	22 22	23 55	25 24	1 24					
6	274 05.4	-15 45.5	32	Alioth	166 59.0	+56 11.8	60	7 36	5 09	22 31	24 00	0 00	1 26	0	0.5	0.1	0.1	
7	289 05.4	46.2	34	Alkaid	153 33.3	+49 31.9	58	7 26	5 08	22 38	24 04	0 04	1 27	30	0.5	0.1	0.0	
8	304 05.4	47.0	55	Al Na'ir	28 37.7	-47 10.6	56	7 18	5 08	22 45	24 08	0 08	1 28	45	0.5	0.1	0.0	
9	319 05.4	47.7	15	Alnilam	276 29.9	-1 13.6	54	7 11	5 08	22 51	24 11	0 11	1 29	75	0.5	0.0	0.0	
10	334 05.4	48.5	25	Alphard	218 38.5	-8 27.9	52	7 04	5 07	22 56	24 14	0 14	1 29	90				
11	349 05.3	49.2					50	6 58	5 07	23 01	24 17	0 17	1 30					
12	4 05.3	-15 50.0	41	Alphecca	126 47.9	+26 51.8	45	6 46	5 04	23 11	24 22	0 22	1 31	Moon's Lower Limb				
13	19 05.3	50.8	1	Alpheratz	358 28.0	+28 51.1	40	6 35	5 02	23 20	24 27	0 27	1 33	Add				
14	34 05.3	51.5	51	Altair	62 50.5	+8 45.2	35	6 26	4 59	23 27	24 31	0 31	1 34	Alt.	6	7	8	
15	49 05.3	52.3	2	Ankaa	353 57.9	-42 32.7	30	6 18	4 56	23 34	24 35	0 35	1 35	0				
16	64 05.2	53.0	42	Antares	113 19.6	-26 20.1	20	6 04	4 49	23 45	24 42	0 42	1 37	4	17.8	16.9	16.2	
17	79 05.2	53.8					10	5 52	4 40	23 54	24 47	0 47	1 38	8	17.8	16.9	16.2	
18	94 05.2	-15 54.5	37	Arcturus	146 35.4	+19 24.7	0	5 40	4 29	24 03	0 03	0 52	1 39	12	17.8	16.9	16.2	
19	109 05.2	55.3	43	Atria	109 00.8	-68 57.1	10	5 29	4 16	24 12	0 12	0 58	1 41	16	17.8	16.9	16.2	
20	124 05.1	56.0	22	Avior	234 35.6	-59 21.8	20	5 16	3 58	24 22	0 22	1 03	1 42	20	17.8	16.9	16.2	
21	139 05.1	56.8	13	Bellatrix	279 18.1	+6 18.7	30	5 01	3 34	24 33	0 33	1 10	1 44	24	17.7	16.9	16.2	
22	154 05.1	57.5	16	Betelgeuse	271 47.8	+7 24.1	35	4 53	3 19	0 00	0 39	1 13	1 45	28	17.7	16.8	16.1	
23	169 05.1	58.3					40	4 43	2 59	0 10	0 46	1 17	1 46	32	17.6	16.8	16.1	
			17	Canopus	264 15.0	-52 40.0	45	4 32	2 33	0 22	0 54	1 22	1 48	36	17.5	16.7	16.1	
7 0	184 05.0	-15 59.0	12	Capella	281 37.9	+45 57.3	50	4 18	1 55	0 36	1 04	1 28	1 49	40	17.4	16.7	16.1	
1	199 05.0	15 59.8	53	Deneb	50 01.0	+45 07.7	52	4 11	1 34	0 43	1 09	1 30	1 50	44	17.3	16.6	16.0	
2	214 05.0	16 00.5	28	Denebola	183 17.9	+14 49.1	54	4 04	1 04	0 50	1 14	1 33	1 51	48	17.2	16.6	16.0	
3	229 05.0	01.3	4	Diphda	349 38.9	-18 13.6	56	3 56	///	0 58	1 19	1 36	1 52	52	17.1	16.5	16.0	
4	244 04.9	02.0					58	3 47	///	1 07	1 26	1 40	1 53	56	17.0	16.4	16.0	
5	259 04.9	02.8	27	Dubhe	194 44.8	+61 59.1	60	3 36	///	1 17	1 32	1 44	1 54	60	16.9	16.4	15.9	
6	274 04.9	-16 03.5	14	Elnath	279 06.9	+28 34.3	S							64	16.8	16.3	15.9	
7	289 04.8	04.3	47	Eltanin	91 06.6	+51 29.9		Lat.	Sunset	Twit. ends	Moonset				68	16.7	16.2	15.9
8	304 04.8	05.0	54	Enif	34 29.5	+9 40.6					6	7	8	9	72	16.5	16.2	15.8
9	319 04.8	05.8	56	Fomalhaut	16 11.4	-29 51.4		N			h m	h m	h m	h m	76	16.4	16.1	15.8
10	334 04.8	06.5	31	Gacrux	172 49.6	-56 51.8	72	13 53	18 17	14 59	14 31	14 10	13 52	80	16.3	16.0	15.8	
11	349 04.7	07.2	29	Gienah	176 37.0	-17 17.8	70	14 28	18 16	14 33	14 17	14 05	13 53	84	16.2	15.9	15.7	
12	4 04.7	-16 08.0	35	Hadar	149 49.9	-60 09.6	68	14 53	18 16	14 13	14 06	14 00	13 54	88	16.1	15.9	15.7	
13	19 04.7	08.7	6	Hamal	328 49.2	+23 15.5	66	15 12	18 15	13 57	13 57	13 56	13 54	90	Add to table, back cover			
14	34 04.6	09.5	48	Kaus Aust.	84 41.3	-34 24.5	64	15 27	18 15	13 44	13 49	13 52	13 55		Moon's Upper Limb			
15	49 04.6	10.2					62	15 40	18 16	13 32	13 42	13 49	13 56		Subtract			
16	64 04.6	11.0	40	Kochab	137 19.1	+74 20.1	60	15 51	18 16	13 23	13 36	13 47	13 56	Alt.	6	7	8	
17	79 04.5	11.7	57	Markab	14 21.2	+14 58.3	58	16 00	18 16	13 14	13 31	13 44	13 56	0				
18	94 04.5	-16 12.4	8	Menkar	314 59.9	+3 55.2	56	16 08	18 16	13 07	13 26	13 42	13 57	4	14.2	14.8	15.2	
19	109 04.5	13.2	36	Menkent	148 59.0	-36 09.2	54	16 16	18 18	13 00	13 22	13 40	13 57	8	14.3	14.8	15.2	
20	124 04.4	13.9	24	Miap'ldus	221 49.0	-69 31.9	52	16 22	18 18	12 54	13 18	13 39	13 57	12	14.3	14.8	15.2	
21	139 04.4	14.7					50	16 28	18 19	12 49	13 15	13 37	13 58	16	14.4	14.8	15.2	
22	154 04.4	15.4	9	Mirfak	309 41.8	+49 42.4	45	16 41	18 21	12 37	13 07	13 34	13 58	20	14.4	14.9	15.2	
23	169 04.3	16.1	50	Nunki	76 52.0	-26 21.2	40	16 52	18 24	12 27	13 01	13 31	13 59	24	14.5	14.9	15.3	
8 0	184 04.3	-16 16.9	52	Peacock	54 27.3	-56 52.8	35	17 01	18 27	12 19	12 55	13 28	13 59	28	14.5	14.9	15.3	
1	199 04.3	17.6	21	Pollux	244 20.3	+28 07.9	30	17 09	18 31	12 11	12 50	13 26	14 00	32	14.6	15.0	15.3	
2	214 04.2	18.4	20	Procyon	245 44.8	+5 20.4	20	17 23	18 38	11 58	12 42	13 22	14 00	36	14.7	15.0	15.3	
3	229 04.2	19.1					10	17 36	18 48	11 47	12 34	13 18	14 01	40	14.8	15.1	15.3	
4	244 04.1	19.8	46	R'alhague	96 46.8	+12 35.6	0	17 47	18 59	11 36	12 27	13 15	14 01	44	14.9	15.1	15.4	
5	259 04.1	20.6	26	Regulus	208 29.5	+12 11.0	10	17 59	19 13	11 25	12 20	13 12	14 02	48	15.0	15.2	15.4	
6	274 04.1	-16 21.3	11	Rigel	281 53.3	-8 15.0	20	18 12	19 31	11 14	12 12	13 08	14 02	52	15.1	15.3	15.4	
7	289 04.0	22.0	38	Rigel Kent.	140 51.5	-60 39.3	30	18 26	19 54	11 00	12 03	13 04	14 03	56	15.2	15.3	15.5	
8	304 04.0	22.8	44	Sabik	103 02.4	-15 40.3	35	18 35	20 10	10 53	11 58	13 01	14 03	60	15.3	15.4	15.5	
9	319 04.0	23.5					40	18 45	20 30	10 44	11 52	12 59	14 03	64	15.4	15.5	15.5	
10	334 03.9	24.2	3	Schedar	350 29.4	+56 18.1	45	18 57	20 57	10 33	11 45	12 56	14 04	68	15.5	15.5	15.5	
11	349 03.9	25.0	45	Shaula	97 20.9	-37 04.4	50	19 11	21 36	10 20	11 37	12 52	14 05	72	15.6	15.6	15.6	
12	4 03.8	-16 25.7	18	Sirius	259 11.6	-16 39.1	52	19 17	21 58	10 14	11 33	12 50	14 05	76	15.7	15.6	15.6	
13	19 03.8	26.4	33	Spica	159 17.1	-10 55.9	54	19 25	22 31	10 08	11 29	12 48	14 05	80	15.8	15.7	15.6	
14	34 03.8	27.2	23	Suhail	223 24.3	-43 15.0	56	19 33	///	10 00	11 24	12 46	14 05	84	15.9	15.8	15.7	
15	49 03.7	27.9					58	19 42	///	9 52	11 19	12 43	14 05	88	16.0	15.8	15.7	
16	64 03.7	28.6	49	Vega	81 08.5	+38 44.8	60	19 53	///	9 42	11 13	12 41	14 06	90	Subtract from table, 			

G M T	T GHA	VENUS -3.3		MARS 2.0		JUPITER -1.6		SATURN 0.7		MOON			
		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
9	h	o	o	o	o	o	o	o	o	o	o	o	o
0	47 23.6	165 50.4	-21 11.9	211 19.8	- 5 49.5	255 50.0	+12 31.1	176 25.4	-16 35.9	246 03.6	131 +	2 18.1	-127
1	62 26.1	180 49.6	12.6	226 20.8	50.1	270 52.2	31.1	191 27.5	35.9	260 35.7	131	2 05.4	-128
2	77 28.5	195 48.8	13.3	241 21.8	50.7	285 54.4	31.0	206 29.7	36.0	275 07.8	132	1 52.6	-127
3	92 31.0	210 48.0	.. 14.0	256 22.7	.. 51.3	300 56.6	.. 30.9	221 31.8	.. 36.1	289 40.0	131	1 39.9	-128
4	107 33.5	225 47.2	14.7	271 23.7	52.0	315 58.7	30.8	236 34.0	36.2	304 12.1	132	1 27.1	-127
5	122 35.9	240 46.4	15.4	286 24.7	52.6	331 00.9	30.7	251 36.2	36.2	318 44.3	133	1 14.4	-128
6	137 38.4	255 45.6	-21 16.1	301 25.7	- 5 53.2	346 03.1	+12 30.6	266 38.3	-16 36.3	333 16.6	132 +	1 01.6	-127
7	152 40.9	270 44.8	16.8	316 26.6	53.8	1 05.3	30.5	281 40.5	36.4	347 48.8	133	0 48.9	-127
8	167 43.3	285 44.0	17.5	331 27.6	54.5	16 07.5	30.4	296 42.7	36.5	2 21.1	133	0 36.2	-128
9	182 45.8	300 43.2	.. 18.1	346 28.6	.. 55.1	31 09.7	.. 30.3	311 44.8	.. 36.5	16 53.4	133	0 23.4	-127
10	197 48.3	315 42.4	18.8	1 29.5	55.7	46 11.9	30.2	326 47.0	36.6	31 25.7	134 +	0 10.7	-127
11	212 50.7	330 41.5	19.5	16 30.5	56.3	61 14.1	30.1	341 49.2	36.7	45 58.1	134	- 0 02.0	-127
12	227 53.2	345 40.7	-21 20.2	31 31.5	- 5 57.0	76 16.2	+12 30.1	356 51.3	-16 36.8	60 30.5	134	- 0 14.7	-127
13	242 55.6	0 39.9	20.9	46 32.5	57.6	91 18.4	30.0	11 53.5	36.9	75 02.9	134	0 27.4	-126
14	257 58.1	15 39.1	21.6	61 33.4	58.2	106 20.6	29.9	26 55.7	36.9	89 35.3	135	0 40.0	-127
15	273 00.6	30 38.3	.. 22.2	76 34.4	.. 58.8	121 22.8	.. 29.8	41 57.8	.. 37.0	104 07.8	134	0 52.7	-126
16	288 03.0	45 37.5	22.9	91 35.4	5 59.5	136 25.0	29.7	57 00.0	37.1	118 40.2	135	1 05.3	-127
17	303 05.5	60 36.7	23.6	106 36.3	6 00.1	151 27.2	29.6	72 02.2	37.2	133 12.7	135	1 18.0	-126
18	318 08.0	75 35.9	-21 24.3	121 37.3	- 6 00.7	166 29.4	+12 29.5	87 04.3	-16 37.2	147 45.2	135	- 1 30.6	-126
19	333 10.4	90 35.1	24.9	136 38.3	01.4	181 31.6	29.4	102 06.5	37.3	162 17.7	136	1 43.2	-126
20	348 12.9	105 34.3	25.6	151 39.3	02.0	196 33.8	29.3	117 08.7	37.4	176 50.3	135	1 55.8	-125
21	3 15.4	120 33.5	.. 26.3	166 40.2	.. 02.6	211 36.0	.. 29.2	132 10.8	.. 37.5	191 22.8	136	2 08.3	-126
22	18 17.8	135 32.7	27.0	181 41.2	03.2	226 38.1	29.1	147 13.0	37.5	205 55.4	136	2 20.9	-125
23	33 20.3	150 31.9	27.6	196 42.2	03.9	241 40.3	29.1	162 15.1	37.6	220 28.0	136	2 33.4	-125
10	48 22.8	165 31.1	-21 28.3	211 43.1	- 6 04.5	256 42.5	+12 29.0	177 17.3	-16 37.7	235 00.6	136	- 2 45.9	-125
1	63 25.2	180 30.3	29.0	226 44.1	05.1	271 44.7	28.9	192 19.5	37.8	249 33.2	136	2 58.4	-124
2	78 27.7	195 29.5	29.6	241 45.1	05.7	286 46.9	28.8	207 21.6	37.8	264 05.8	136	3 10.8	-125
3	93 30.1	210 28.6	.. 30.3	256 46.0	.. 06.4	301 49.1	.. 28.7	222 23.8	.. 37.9	278 38.4	136	3 23.3	-124
4	108 32.6	225 27.8	31.0	271 47.0	07.0	316 51.3	28.6	237 26.0	38.0	293 11.0	137	3 35.7	-124
5	123 35.1	240 27.0	31.6	286 48.0	07.6	331 53.5	28.5	252 28.1	38.1	307 43.7	136	3 48.1	-123
6	138 37.5	255 26.2	-21 32.3	301 49.0	- 6 08.2	346 55.7	+12 28.4	267 30.3	-16 38.1	322 16.3	137	- 4 00.4	-124
7	153 40.0	270 25.4	33.0	316 49.9	08.9	1 57.9	28.3	282 32.5	38.2	336 49.0	136	4 12.8	-123
8	168 42.5	285 24.6	33.6	331 50.9	09.5	17 00.1	- 28.3	297 34.6	38.3	351 21.6	137	4 25.1	-122
9	183 44.9	300 23.8	.. 34.3	346 51.9	.. 10.1	32 02.3	.. 28.2	312 36.8	.. 38.4	5 54.3	137	4 37.3	-123
10	198 47.4	315 23.0	34.9	1 52.8	10.7	47 04.5	28.1	327 39.0	38.5	20 27.0	136	4 49.6	-122
11	213 49.9	330 22.1	35.6	16 53.8	11.3	62 06.7	28.0	342 41.1	38.5	34 59.6	137	5 01.8	-122
12	228 52.3	345 21.3	-21 36.3	31 54.8	- 6 12.0	77 08.9	+12 27.9	357 43.3	-16 38.6	49 32.3	137	- 5 14.0	-121
13	243 54.8	0 20.5	36.9	46 55.7	12.6	92 11.0	27.8	12 45.4	38.7	64 05.0	137	5 26.1	-121
14	258 57.2	15 19.7	37.6	61 56.7	13.2	107 13.2	27.7	27 47.6	38.8	78 37.7	136	5 38.2	-121
15	273 59.7	30 18.9	.. 38.2	76 57.7	.. 13.8	122 15.4	.. 27.6	42 49.8	.. 38.8	93 10.3	137	5 50.3	-121
16	289 02.2	45 18.1	38.9	91 58.7	14.5	137 17.6	27.5	57 51.9	38.9	107 43.0	137	6 02.4	-120
17	304 04.6	60 17.2	39.5	106 59.6	15.1	152 19.8	27.5	72 54.1	39.0	122 15.7	137	6 14.4	-120
18	319 07.1	75 16.4	-21 40.2	122 00.6	- 6 15.7	167 22.0	+12 27.4	87 56.3	-16 39.1	136 48.4	136	- 6 26.4	-119
19	334 09.6	90 15.6	40.8	137 01.6	16.3	182 24.2	27.3	102 58.4	39.1	151 21.0	137	6 38.3	-119
20	349 12.0	105 14.8	41.5	152 02.5	17.0	197 26.4	27.2	118 00.6	39.2	165 53.7	136	6 50.2	-119
21	4 14.5	120 14.0	.. 42.1	167 03.5	.. 17.6	212 28.6	.. 27.1	133 02.8	.. 39.3	180 26.3	137	7 02.1	-118
22	19 17.0	135 13.1	42.8	182 04.5	18.2	227 30.8	27.0	148 04.9	39.4	194 59.0	136	7 13.9	-118
23	34 19.4	150 12.3	43.4	197 05.4	18.8	242 33.0	26.9	163 07.1	39.4	209 31.6	137	7 25.7	-117
11	49 21.9	165 11.5	-21 44.1	212 06.4	- 6 19.5	257 35.2	+12 26.8	178 09.3	-16 39.5	224 04.3	136	- 7 37.4	-117
1	64 24.4	180 10.7	44.7	227 07.4	20.1	272 37.4	26.8	193 11.4	39.6	238 36.9	136	7 49.1	-117
2	79 26.8	195 09.9	45.4	242 08.3	20.7	287 39.6	26.7	208 13.6	39.7	253 09.5	136	8 00.8	-116
3	94 29.3	210 09.0	.. 46.0	257 09.3	.. 21.3	302 41.8	.. 26.6	223 15.7	.. 39.8	267 42.1	137	8 12.4	-116
4	109 31.7	225 08.2	46.6	272 10.3	22.0	317 44.0	26.5	238 17.9	39.8	282 14.8	136	8 24.0	-115
5	124 34.2	240 07.4	47.3	287 11.2	22.6	332 46.2	26.4	253 20.1	39.9	296 47.4	135	8 35.5	-115
6	139 36.7	255 06.6	-21 47.9	302 12.2	- 6 23.2	347 48.4	+12 26.3	268 22.2	-16 40.0	311 19.9	136	- 8 47.0	-114
7	154 39.1	270 05.7	48.5	317 13.2	23.8	2 50.6	26.2	283 24.4	40.1	325 52.5	136	8 58.4	-114
8	169 41.6	285 04.9	49.2	332 14.1	24.4	17 52.8	26.1	298 26.6	40.1	340 25.1	135	9 09.8	-113
9	184 44.1	300 04.1	.. 49.8	347 15.1	.. 25.1	32 55.0	.. 26.1	313 28.7	.. 40.2	354 57.6	136	9 21.1	-113
10	199 46.5	315 03.3	50.5	2 16.1	25.7	47 57.2	26.0	328 30.9	40.3	9 30.2	135	9 32.4	-113
11	214 49.0	330 02.4	51.1	17 17.0	26.3	62 59.4	25.9	343 33.1	40.4	24 02.7	135	9 43.7	-112
12	229 51.5	345 01.6	-21 51.7	32 18.0	- 6 26.9	78 01.6	+12 25.8	358 35.2	-16 40.4	38 35.2	135	- 9 54.9	-111
13	244 53.9	0 00.8	52.3	47 19.0	27.6	93 03.8	25.7	13 37.4	40.5	53 07.7	135	10 06.0	-111
14	259 56.4	15 00.0	53.0	62 20.0	28.2	108 06.0	25.6	28 39.6	40.6	67 40.2	134	10 17.1	-110
15	274 58.9	29 59.1	.. 53.6	77 20.9	.. 28.8	123 08.2	.. 25.5	43 41.7	.. 40.7	82 12.6	135	10 28.1	-110
16	290 01.3	44 58.3	54.2	92 21.9	29.4	138 10.4	25.5	58 43.9	40.7	96 45.1	134	10 39.1	-109
17	305 03.8	59 57.5	54.9	107 22.9	30.0	153 12.6	25.4	73 46.0	40.8	111 17.5	134	10 50.0	-109
18	320 06.2	74 56.6	-21 55.5	122 23.8	- 6 30.7	168 14.8	+12 25.3	88 48.2	-16 40.9	125 49.9	134	-11 00.9	-108
19	335 08.7	89 55.8	56.1	137 24.8	31.3	183 17.0	25.2	103 50.4	41.0	140 22.3	133	11 11.7	-107
20	350 11.2	104 55.0	56.7	152 25.8	31.9	198 19.2	25.1	118 52.5	41.0	154 54.6	134	11 22.4	-107
21	5 13.6	119 54.2	.. 57.4	167 26.7	.. 32.5	213 21.4	.. 25.0	133 54.7	.. 41.1	169 27.0	133	11 33.1	-107
22	20 16.1	134 53.3	58.0	182 27.7	33.2	228 23.6	24.9	148 56.9	41.2	183 59.3	133	11 43.8	-105
23	35 18.6	149 52.5	58.6	197 28.7	33.8	243 25.8	24.9	163 59.0	41.3	198 31.6	133	11 54.3	-106
24	50 21.0	164 51.7	-21 59.2	212 29.6	- 6 34.4	258 28.0	+12 24.8	179 01.2	-16 41.3	213 03.9	133	-12 04.9	-104
code	-	- 8	- 6	+ 9	- 6	+ 21	- 1	+ 21	- 1				

G M T	SUN		STARS				Lat.	Sunrise	Twilt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS			
	GHA	Dec.	No.	Name	SHA	Dec.				9	10	11	12	Alt.	Sun's Low'r Limb Add	Venus Add	Mars Add
9	184 03.3	-16 34.5	7	Acamar	315 50.6	-40 28.7	72	9 56	5 16	1 15	3 10	5 06	7 10	0			
0	199 03.3	35.2	5	Achernar	335 58.2	-57 27.6	70	9 15	5 17	1 17	3 05	4 52	6 43	0			
1	214 03.3	35.9	30	Acrux	173 58.2	-62 51.1	68	8 47	5 16	1 20	3 00	4 41	6 23	0			
2	229 03.2	36.6	19	Adhara	255 46.2	-28 54.5	66	8 26	5 17	1 21	2 57	4 32	6 07	0			
3	244 03.2	37.4	10	Aldebaran	291 38.6	+16 25.4	64	8 09	5 16	1 23	2 54	4 24	5 54	0			
4	259 03.1	38.1					62	7 55	5 15	1 24	2 52	4 17	5 43	30	0.5	0.1	0.1
5	274 03.1	-16 38.8	32	Alioth	166 58.9	+56 11.7	60	7 43	5 15	1 26	2 49	4 12	5 34	45	0.5	0.1	0.0
6	289 03.0	39.5	34	Alkaid	153 33.3	+49 31.9	58	7 33	5 14	1 27	2 48	4 07	5 26	60	0.5	0.1	0.0
7	304 03.0	40.3	55	Al Na'ir	28 37.7	-47 10.6	56	7 25	5 13	1 28	2 46	4 03	5 18	75	0.5	0.0	0.0
8	319 02.9	41.0	15	Alnilam	276 29.9	-1 13.6	54	7 17	5 13	1 29	2 44	3 59	5 12	90	0.5	0.0	0.0
9	334 02.9	41.7	25	Alphard	218 38.5	-8 27.9	52	7 10	5 12	1 29	2 43	3 55	5 07				
10	349 02.8	42.4					50	7 03	5 11	1 30	2 42	3 52	5 01				
11	4 02.8	-16 43.1	41	Alphecca	126 47.9	+26 51.8	45	6 50	5 07	1 31	2 39	3 45	4 50	Moon's Lower Limb			
12	19 02.7	43.9	1	Alpheratz	358 28.0	+28 51.1	40	6 38	5 04	1 33	2 36	3 39	4 41	Add			
13	34 02.7	44.6	51	Altair	62 50.5	+8 45.2	35	6 29	5 01	1 34	2 35	3 34	4 34	Alt.	9	10	11
14	49 02.6	45.3	2	Ankaa	353 57.9	-42 32.7	30	6 20	4 58	1 35	2 33	3 30	4 27	0			
15	64 02.6	46.0	42	Antares	113 19.6	-26 20.1	20	6 06	4 50	1 37	2 30	3 23	4 15	0			
16	79 02.5	46.7					10	5 53	4 40	1 38	2 27	3 16	4 05	4	15.4	14.7	14.0
17	94 02.5	-16 47.5	37	Arcturus	146 35.4	+19 24.7	0	5 40	4 28	1 39	2 25	3 10	3 56	8	15.4	14.7	14.0
18	109 02.4	48.2	43	Atria	109 00.8	-68 57.1	10	5 28	4 14	1 41	2 22	3 04	3 46	12	15.4	14.7	14.0
19	124 02.4	48.9	22	Avior	234 35.6	-59 21.8	20	5 15	3 56	1 42	2 20	2 58	3 36	16	15.4	14.7	14.1
20	139 02.3	49.6	13	Bellatrix	279 18.0	+6 18.7	30	4 59	3 31	1 44	2 17	2 50	3 25	20	15.4	14.7	14.1
21	154 02.3	50.3	16	Betelgeuse	271 47.8	+7 24.1	35	4 50	3 15	1 45	2 16	2 46	3 18	24	15.4	14.7	14.1
22	169 02.2	51.0					40	4 40	2 55	1 46	2 14	2 42	3 11	28	15.4	14.8	14.2
23			17	Canopus	264 15.0	-52 40.0	45	4 28	2 27	1 48	2 12	2 36	3 02	32	15.4	14.8	14.2
0	184 02.2	-16 51.8	12	Capella	281 37.9	+45 57.3	50	4 13	1 45	1 49	2 09	2 30	2 52	36	15.4	14.8	14.3
1	199 02.1	52.5	53	Deneb	50 01.0	+45 07.7	52	4 06	1 21	1 50	2 08	2 27	2 47	40	15.4	14.8	14.3
2	214 02.1	53.2	28	Denebola	183 17.8	+14 49.1	54	3 58	0 44	1 51	2 07	2 24	2 42	44	15.5	14.9	14.4
3	229 02.0	53.9	4	Diphda	349 38.9	-18 13.6	56	3 49	///	1 52	2 06	2 20	2 36	48	15.5	14.9	14.5
4	244 02.0	54.6					58	3 40	///	1 53	2 04	2 16	2 30	52	15.5	14.9	14.5
5	259 01.9	55.3	27	Dubhe	194 44.8	+61 59.1	60	3 28	///	1 54	2 03	2 12	2 23	56	15.5	15.0	14.6
6	274 01.8	-16 56.0	14	Elnath	279 06.9	+28 34.3	S							60	15.5	15.0	14.7
7	289 01.8	56.7	47	Eltanin	91 06.6	+51 29.9	Lat.	Sunset	Twilt. ends	Moonset				64	15.5	15.1	14.7
8	304 01.7	57.5	54	Enif	34 29.5	+9 40.6	N.	h m	h m	h m	h m	h m	h m	72	15.5	15.2	14.9
9	319 01.7	58.2	56	Fomalhaut	16 11.4	-29 51.4		h m	h m	h m	h m	h m	h m	76	15.5	15.2	14.9
10	334 01.6	58.9					72	13 30	18 07	13 52	13 33	13 13	12 44	80	15.5	15.2	15.0
11	349 01.6	16 59.6	31	Gacrux	172 49.6	-56 51.8	70	14 12	18 07	13 53	13 41	13 29	13 13	84	15.5	15.3	15.1
12	4 01.5	-17 00.3	29	Gienah	176 37.0	-17 17.8	68	14 40	18 07	13 54	13 48	13 41	13 34	88	15.5	15.3	15.1
13	19 01.5	01.0	35	Hadar	149 49.9	-60 09.6	66	15 01	18 08	13 54	13 53	13 52	13 51	90	15.5	15.3	15.2
14	34 01.4	01.7	6	Hamal	328 49.2	+23 15.5	64	15 18	18 09	13 55	13 58	14 01	14 05	Add to table, back cover			
15	49 01.3	02.4	48	Kaus Aust.	84 41.3	-34 24.5	62	15 32	18 09	13 56	14 02	14 09	14 17	Moon's Upper Limb			
16	64 01.3	03.1					60	15 44	18 11	13 56	14 05	14 15	14 27	Subtract			
17	79 01.2	03.8	40	Kochab	137 19.1	+74 20.1	58	15 54	18 11	13 56	14 08	14 21	14 36	Alt.	9	10	11
18	94 01.2	-17 04.5	57	Markab	14 21.2	+14 58.3	56	16 03	18 12	13 57	14 11	14 26	14 44	0	15.6	16.1	16.4
19	109 01.1	05.3	8	Menkar	314 59.9	+3 55.2	54	16 10	18 13	13 57	14 14	14 31	14 51	4	15.6	16.1	16.4
20	124 01.0	06.0	36	Menkent	148 59.0	-36 09.2	52	16 18	18 15	13 57	14 16	14 35	14 57	8	15.6	16.0	16.4
21	139 01.0	06.7	24	Miap'dus	221 49.0	-69 31.9	50	16 24	18 15	13 58	14 18	14 39	15 03	12	15.6	16.0	16.4
22	154 00.9	07.4					45	16 38	18 19	13 58	14 23	14 48	15 15	16	15.6	16.0	16.4
23	169 00.9	08.1	9	Mirfak	309 41.7	+49 42.4	40	16 49	18 22	13 59	14 26	14 55	15 25	20	15.6	16.0	16.3
0	184 00.8	-17 08.8	52	Peacock	54 27.3	-56 52.8	35	16 59	18 26	13 59	14 30	15 01	15 34	24	15.6	16.0	16.3
1	199 00.7	09.5	21	Pollux	244 20.3	+28 07.9	30	17 07	18 29	14 00	14 33	15 06	15 42	28	15.6	16.0	16.3
2	214 00.7	10.2	20	Procyon	245 44.8	+5 20.4	20	17 22	18 38	14 00	14 38	15 16	15 55	32	15.6	16.0	16.3
3	229 00.6	10.9					10	17 35	18 48	14 01	14 42	15 24	16 07	36	15.6	16.0	16.3
4	244 00.5	11.6	46	R'alhague	96 46.8	+12 35.6	0	17 47	18 59	14 01	14 46	15 32	16 18	40	15.6	16.0	16.3
5	259 00.5	12.3	26	Regulus	208 29.5	+12 10.9	10	18 00	19 14	14 02	14 51	15 39	16 29	44	15.6	15.9	16.2
6	274 00.4	-17 13.0	11	Rigel	281 53.3	-8 15.0	20	18 13	19 32	14 02	14 55	15 48	16 40	48	15.6	15.9	16.2
7	289 00.3	13.7	38	Rigel Kent.	140 51.5	-60 39.3	30	18 29	19 58	14 03	15 00	15 57	16 54	52	15.6	15.9	16.2
8	304 00.3	14.4	44	Sabik	103 02.4	-15 40.3	35	18 38	20 14	14 03	15 03	16 03	17 02	56	15.6	15.8	16.1
9	319 00.2	15.1					40	18 48	20 35	14 03	15 07	16 09	17 11	60	15.6	15.8	16.1
10	334 00.2	15.8	3	Schedar	350 29.4	+56 18.1	45	19 01	21 04	14 04	15 11	16 16	17 21	64	15.6	15.8	16.0
11	349 00.1	16.5	45	Shaula	97 20.9	-37 04.4	50	19 16	21 46	14 04	15 15	16 25	17 34	68	15.6	15.7	15.9
12	4 00.0	-17 17.2	18	Sirius	259 11.6	-16 39.1	52	19 23	22 12	14 05	15 17	16 29	17 40	72	15.6	15.7	15.8
13	19 00.0	17.9	33	Spica	159 17.1	-10 55.9	54	19 31	22 54	14 05	15 20	16 34	17 47	76	15.6	15.6	15.7
14	33 59.9	18.6	23	Suhail	223 24.2	-43 15.0	56	19 40	///	14 05	15 22	16 39	17 54	80	15.6	15.6	15.6
15	48 59.8	19.3					58	19 50	///	14 05	15 25	16 44	18 02	84	15.5	15.5	15.5
16	63 59.8	20.0	49	Vega	81 08.5	+38 44.8	60	20 01	///	14 06	15 29	16 51	18 12	88	15.5	15.5	15.4
17	78 59.7	20.6	39	Zub'g'bi	137 53.6	-15 51.5	S							90	15.5	15.4	15.3
18	93 59.6	-17 21.3	Equation of Time (App.—Mean)				GMT of Transit				Meridian of Greenwich				Subtract from table, back cover		
19	108 59.5	22.0	9				10				11						
20	12																

G M T	T GHA	VENUS - 3.3		MARS 2.0		JUPITER - 1.6		SATURN 0.7		MOON			
		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
12 0	50 21.0	164 51.7	-21 59.2	212 29.6	- 6 34.4	258 28.0	+12 24.8	179 01.2	-16 41.3	213 03.9	133	-12 04.9	-104
1 1	65 23.5	179 50.8	21 59.8	227 30.6	35.0	273 30.2	24.7	194 03.4	41.4	227 36.2	132	12 15.3	-104
2 2	80 26.0	194 50.0	22 00.4	242 31.6	35.6	288 32.4	24.6	209 05.5	41.5	242 08.4	133	12 25.7	-103
3 3	95 28.4	209 49.2	.. 01.1	257 32.5	.. 36.3	303 34.6	.. 24.5	224 07.7	.. 41.6	256 40.7	132	12 36.0	-103
4 4	110 30.9	224 48.3	01.7	272 33.5	36.9	318 36.8	24.4	239 09.8	41.7	271 12.9	131	12 46.3	-102
5 5	125 33.4	239 47.5	02.3	287 34.5	37.5	333 39.1	24.3	254 12.0	41.7	285 45.0	132	12 56.5	-102
6 6	140 35.8	254 46.6	-22 02.9	302 35.4	- 6 38.1	348 41.3	+12 24.3	269 14.2	-16 41.8	300 17.2	131	-13 06.7	-100
7 7	155 38.3	269 45.8	03.5	317 36.4	38.8	3 43.5	24.2	284 16.3	41.9	314 49.3	131	13 16.7	-100
8 8	170 40.7	284 45.0	04.1	332 37.3	39.4	18 45.7	24.1	299 18.5	42.0	329 21.4	131	13 26.7	-100
9 9	185 43.2	299 44.1	.. 04.7	347 38.3	.. 40.0	33 47.9	.. 24.0	314 20.7	.. 42.0	343 53.5	131	-13 36.7	- 99
10 10	200 45.7	314 43.3	05.3	2 39.3	40.6	48 50.1	23.9	329 22.8	42.1	358 25.6	130	13 46.6	- 98
11 11	215 48.1	329 42.5	05.9	17 40.2	41.2	63 52.3	23.8	344 25.0	42.2	12 57.6	130	13 56.4	- 97
12 12	230 50.6	344 41.6	-22 06.5	32 41.2	- 6 41.9	78 54.5	+12 23.8	359 27.2	-16 42.3	27 29.6	130	-14 06.1	- 97
13 13	245 53.1	359 40.8	07.2	47 42.2	42.5	93 56.7	23.7	14 29.3	42.3	42 01.6	130	14 15.8	- 96
14 14	260 55.5	14 39.9	07.8	62 43.1	43.1	108 58.9	23.6	29 31.5	42.4	56 33.6	129	14 25.4	- 95
15 15	275 58.0	29 39.1	.. 08.4	77 44.1	.. 43.7	124 01.1	.. 23.5	44 33.6	.. 42.5	71 05.5	129	-14 34.9	- 95
16 16	291 00.5	44 38.3	09.0	92 45.1	44.3	139 03.3	23.4	59 35.8	42.6	85 37.4	129	14 44.4	- 93
17 17	306 02.9	59 37.4	09.6	107 46.0	45.0	154 05.5	23.3	74 38.0	42.6	100 09.3	128	14 53.7	- 94
18 18	321 05.4	74 36.6	-22 10.2	122 47.0	- 6 45.6	169 07.7	+12 23.3	89 40.1	-16 42.7	114 41.1	128	-15 03.1	- 92
19 19	336 07.8	89 35.7	10.8	137 48.0	46.2	184 09.9	23.2	104 42.3	42.8	129 12.9	128	15 12.3	- 91
20 20	351 10.3	104 34.9	11.4	152 48.9	46.8	199 12.2	23.1	119 44.5	42.9	143 44.7	128	15 21.4	- 91
21 21	6 12.8	119 34.1	.. 11.9	167 49.9	.. 47.4	214 14.4	.. 23.0	134 46.6	.. 42.9	158 16.5	128	-15 30.5	- 90
22 22	21 15.2	134 33.2	12.5	182 50.9	48.1	229 16.6	22.9	149 48.8	43.0	172 48.3	127	15 39.5	- 90
23 23	36 17.7	149 32.4	13.1	197 51.8	48.7	244 18.8	22.8	164 50.9	43.1	187 20.0	126	15 48.5	- 88
13 0	51 20.2	164 31.5	-22 13.7	212 52.8	- 6 49.3	259 21.0	+12 22.8	179 53.1	-16 43.2	201 51.6	127	-15 57.3	- 88
1 1	66 22.6	179 30.7	14.3	227 53.8	49.9	274 23.2	22.7	194 55.3	43.2	216 23.3	126	16 06.1	- 87
2 2	81 25.1	194 29.8	14.9	242 54.7	50.5	289 25.4	22.6	209 57.4	43.3	230 54.9	126	16 14.8	- 86
3 3	96 27.6	209 29.0	.. 15.5	257 55.7	.. 51.2	304 27.6	.. 22.5	224 59.6	.. 43.4	245 26.5	126	-16 23.4	- 86
4 4	111 30.0	224 28.2	16.1	272 56.6	51.8	319 29.8	22.4	240 01.8	43.5	259 58.1	125	16 32.0	- 84
5 5	126 32.5	239 27.3	16.7	287 57.6	52.4	334 32.0	22.3	255 03.9	43.5	274 29.6	126	16 40.4	- 84
6 6	141 35.0	254 26.5	-22 17.3	302 58.6	- 6 53.0	349 34.3	+12 22.3	270 06.1	-16 43.6	289 01.2	124	-16 48.8	- 83
7 7	156 37.4	269 25.6	17.8	317 59.5	53.6	4 36.5	22.2	285 08.3	43.7	303 32.6	125	16 57.1	- 82
8 8	171 39.9	284 24.8	18.4	333 00.5	54.3	19 38.7	22.1	300 10.4	43.8	318 04.1	124	17 05.3	- 82
9 9	186 42.3	299 23.9	.. 19.0	348 01.5	.. 54.9	34 40.9	.. 22.0	315 12.6	.. 43.8	332 35.5	124	-17 13.5	- 80
10 10	201 44.8	314 23.1	19.6	3 02.4	55.5	49 43.1	21.9	330 14.7	43.9	347 06.9	124	17 21.5	- 80
11 11	216 47.3	329 22.2	20.2	18 03.4	56.1	64 45.3	21.8	345 16.9	44.0	1 38.3	123	17 29.5	- 78
12 12	231 49.7	344 21.4	-22 20.7	33 04.4	- 6 56.7	79 47.5	+12 21.8	0 19.1	-16 44.1	16 09.6	123	-17 37.3	- 78
13 13	246 52.2	359 20.5	21.3	48 05.3	57.4	94 49.7	21.7	15 21.2	44.2	30 40.9	123	17 45.1	- 77
14 14	261 54.7	14 19.7	21.9	63 06.3	58.0	109 52.0	21.6	30 23.4	44.2	45 12.2	123	17 52.8	- 77
15 15	276 57.1	29 18.8	.. 22.5	78 07.3	.. 58.6	124 54.2	.. 21.5	45 25.6	.. 44.3	59 43.5	122	-18 00.5	- 75
16 16	291 59.6	44 18.0	23.1	93 08.2	59.2	139 56.4	21.4	60 27.7	44.4	74 14.7	122	18 08.0	- 74
17 17	307 02.1	59 17.1	23.6	108 09.2	6 59.8	154 58.6	21.4	75 29.9	44.5	88 45.9	122	18 15.4	- 74
18 18	322 04.5	74 16.3	-22 24.2	123 10.1	- 7 00.4	170 00.8	+12 21.3	90 32.0	-16 44.5	103 17.1	121	-18 22.8	- 73
19 19	337 07.0	89 15.4	24.8	138 11.1	01.1	185 03.0	21.2	105 34.2	44.6	117 48.2	121	18 30.1	- 71
20 20	352 09.5	104 14.6	25.3	153 12.1	01.7	200 05.2	21.1	120 36.4	44.7	132 19.3	121	18 37.2	- 71
21 21	7 11.9	119 13.7	.. 25.9	168 13.0	.. 02.3	215 07.5	.. 21.0	135 38.5	.. 44.8	146 50.4	121	-18 44.3	- 70
22 22	22 14.4	134 12.9	26.5	183 14.0	02.9	230 09.7	20.9	150 40.7	44.8	161 21.5	120	18 51.3	- 69
23 23	37 16.8	149 12.0	27.0	198 15.0	03.5	245 11.9	20.9	165 42.9	44.9	175 52.5	120	18 58.2	- 68
14 0	52 19.3	164 11.1	-22 27.6	213 15.9	- 7 04.2	260 14.1	+12 20.8	180 45.0	-16 45.0	190 23.5	120	-19 05.0	- 67
1 1	67 21.8	179 10.3	28.2	228 16.9	04.8	275 16.3	20.7	195 47.2	45.1	204 54.5	119	19 11.7	- 67
2 2	82 24.2	194 09.4	28.7	243 17.8	05.4	290 18.5	20.6	210 49.4	45.1	219 25.4	120	19 18.4	- 65
3 3	97 26.7	209 08.6	.. 29.3	258 18.8	.. 06.0	305 20.8	.. 20.5	225 51.5	.. 45.2	233 56.4	119	-19 24.9	- 64
4 4	112 29.2	224 07.7	29.9	273 19.8	06.6	320 23.0	20.5	240 53.7	45.3	248 27.3	118	19 31.3	- 64
5 5	127 31.6	239 06.9	30.4	288 20.7	07.2	335 25.2	20.4	255 55.8	45.4	262 58.1	119	19 37.7	- 62
6 6	142 34.1	254 06.0	-22 31.0	303 21.7	- 7 07.9	350 27.4	+12 20.3	270 58.0	-16 45.4	277 29.0	118	-19 43.9	- 62
7 7	157 36.6	269 05.2	31.5	318 22.7	08.5	5 29.6	20.2	286 00.2	45.5	291 59.8	118	19 50.1	- 60
8 8	172 39.0	284 04.3	32.1	333 23.6	09.1	20 31.8	20.1	301 02.3	45.6	306 30.6	118	19 56.1	- 60
9 9	187 41.5	299 03.4	.. 32.6	348 24.6	.. 09.7	35 34.1	.. 20.1	316 04.5	.. 45.7	321 01.4	117	-20 02.1	- 58
10 10	202 43.9	314 02.6	33.2	3 25.5	10.3	50 36.3	20.0	331 06.7	45.7	335 32.1	117	20 07.9	- 58
11 11	217 46.4	329 01.7	33.7	18 26.5	11.0	65 38.5	19.9	346 08.8	45.8	350 02.8	117	20 13.7	- 57
12 12	232 48.9	344 00.9	-22 34.3	33 27.5	- 7 11.6	80 40.7	+12 19.8	1 11.0	-16 45.9	4 33.5	117	-20 19.4	- 55
13 13	247 51.3	359 00.0	34.8	48 28.4	12.2	95 42.9	19.7	16 13.1	46.0	19 04.2	116	20 24.9	- 55
14 14	262 53.8	13 59.1	35.4	63 29.4	12.8	110 45.2	19.7	31 15.3	46.0	33 34.8	117	20 30.4	- 54
15 15	277 56.3	28 58.3	.. 35.9	78 30.3	.. 13.4	125 47.4	.. 19.6	46 17.5	.. 46.1	48 05.5	116	-20 35.8	- 52
16 16	292 58.7	43 57.4	36.5	93 31.3	14.0	140 49.6	19.5	61 19.6	46.2	62 36.1	116	20 41.0	- 52
17 17	308 01.2	58 56.5	37.0	108 32.3	14.7	155 51.8	19.4	76 21.8	46.3	77 06.7	115	20 46.2	- 51
18 18	323 03.7	73 55.7	-22 37.6	123 33.2	- 7 15.3	170 54.0	+12 19.3	91 24.0	-16 46.3	91 37.2	116	-20 51.3	- 49
19 19	338 06.1	88 54.8	38.1	138 34.2	15.9	185 56.3	19.3	106 26.1	46.4	106 07.8	115	20 56.2	- 49
20 20	353 08.6	103 54.0	38.7	153 35.2	16.5	200 58.5	19.2	121 28.3	46.5	120 38.3	115	21 01.1	- 48
21 21	8 11.1	118 53.1	.. 39.2	168 36.1	.. 17.1	216 00.7	.. 19.1	136 30.4	.. 46.6	135 08.8	115	-21 05.9	- 46
22 22	23 13.5	133 52.2	39.8	183 37.1	17.7	231 02.9	19.0	151 32.6	46.6	149 39.3	114	21 10.5	- 46
23 23	38 16.0	148 51.4	40.3	198 38.0	18.4	246 05.2	18.9	166 34.8	46.7	164 09.7	115	21 15.1	- 44
24	53 18.4	163 50.5	-22 40.8	213 39.0	- 7 19.0	261 07.4	+12 18.9	181 36.9	-16 46.8	178 40.2	114	-21 19.5	- 44
code	-	- 9	- 6	+ 9	- 7	+ 22	- 1	+ 21	- 1				

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.	No.	Name	SHA	Dec.								Sun's Low'r Limb	Venus	Mars			
										12	13	14	15				Add	Add	Add
h	°	'					N	h	m	h	m	h	m	h	m	Alt.	'	'	'
12	0	183 59.2	-17 25.5	7	Acamar	315 50.6	-40 28.7	72	10 25	5 27	7 10	9 52	10 10	10 50	Alt.	'	'	'	
	1	198 59.1	26.2	5	Achernar	335 58.2	-57 27.6	70	9 32	5 26	6 43	8 44	10 11	10 51	Add	'	'	'	
	2	213 59.1	26.9	30	Acrux	173 58.2	-62 51.1	68	9 00	5 25	6 23	8 08	10 01	10 50		'	'	'	
	3	228 59.0	27.6	19	Adhara	255 46.2	-28 54.5	66	8 37	5 24	6 07	7 43	9 19	10 50		'	'	'	
	4	243 58.9	28.3	10	Aldebaran	291 38.6	+16 25.4	64	8 19	5 23	5 54	7 23	8 50	10 11	0	0.5	0.1	0.1	
	5	258 58.8	28.9					62	8 04	5 22	5 43	7 07	8 29	9 43	30	0.5	0.1	0.0	
	6	273 58.8	-17 29.6	32	Alioth	166 58.9	+56 11.7	60	7 51	5 21	5 34	6 54	8 11	9 22	45	0.5	0.1	0.0	
	7	288 58.7	30.3	34	Alkaid	153 33.3	+49 31.8	58	7 40	5 20	5 26	6 43	7 57	9 05	60	0.5	0.0	0.0	
	8	303 58.6	31.0	55	Al Na'ir	28 37.8	-47 10.6	56	7 31	5 19	5 18	6 33	7 44	8 50	75	0.5	0.0	0.0	
	9	318 58.5	31.7	15	Alnilam	276 29.9	-1 13.6	54	7 23	5 18	5 12	6 24	7 33	8 37	90	0.5	0.0	0.0	
	10	333 58.5	32.4	25	Alphard	218 38.5	-8 28.0	52	7 15	5 16	5 07	6 17	7 24	8 26					
	11	348 58.4	33.1					50	7 08	5 15	5 01	6 10	7 15	8 17					
	12	3 58.3	-17 33.7	41	Alphecca	126 47.9	+26 51.8	45	6 54	5 12	4 50	5 55	6 57	7 56	Moon's Lower Limb				
	13	18 58.2	34.4	1	Alpheratz	358 28.0	+28 51.1	40	6 42	5 08	4 41	5 43	6 42	7 40	Add				
	14	33 58.2	35.1	51	Altair	62 50.5	+8 45.2	35	6 32	5 04	4 34	5 32	6 30	7 26	Alt.	12	13	14	
	15	48 58.1	35.8	2	Ankaa	353 57.9	-42 32.7	30	6 23	5 00	4 27	5 23	6 19	7 14	0	'	'	'	
	16	63 58.0	36.5	42	Antares	113 19.6	-26 20.1	20	6 07	4 51	4 15	5 08	6 01	6 53	4	13.5	13.0	12.5	
	17	78 57.9	37.2					10	5 54	4 40	4 05	4 54	5 44	6 35	8	13.5	13.0	12.5	
	18	93 57.9	-17 37.8	37	Arcturus	146 35.4	+19 24.7	0	5 41	4 29	3 56	4 42	5 29	6 18	12	13.5	13.0	12.5	
	19	108 57.8	38.5	43	Atria	109 00.8	-68 57.0	10	5 28	4 14	3 46	4 29	5 15	6 02	16	13.6	13.1	12.6	
	20	123 57.7	39.2	22	Avior	234 35.5	-59 21.8	20	5 14	3 55	3 36	4 16	4 59	5 44	20	13.6	13.2	12.7	
	21	138 57.6	39.9	13	Bellatrix	279 18.0	+6 18.7	30	4 57	3 29	3 25	4 01	4 41	5 23	24	13.7	13.2	12.7	
	22	153 57.5	40.6	16	Betelge'se	271 47.8	+7 24.1	35	4 48	3 12	3 18	3 53	4 30	5 11	28	13.7	13.3	12.8	
	23	168 57.5	41.2					40	4 37	2 50	3 11	3 43	4 18	4 58	32	13.8	13.3	12.9	
				17	Canopus	264 14.9	-52 40.1	45	4 24	2 20	3 02	3 31	4 04	4 42	36	13.9	13.4	13.0	
				12	Capella	281 37.9	+45 57.3	50	4 09	1 36	2 52	3 17	3 47	4 22	40	13.9	13.5	13.1	
				53	Deneb	50 01.0	+45 07.7	52	4 01	1 08	2 47	3 11	3 39	4 12	44	14.0	13.6	13.2	
				28	Denebola	183 17.8	+14 49.0	54	3 53	0 16	2 42	3 04	3 30	4 02	48	14.1	13.7	13.4	
				4	Diphda	349 38.9	-18 13.6	56	3 44	///	2 36	2 56	3 19	3 50	52	14.2	13.8	13.5	
				4				58	3 33	///	2 30	2 47	3 08	3 36	56	14.3	13.9	13.6	
				27	Dubhe	194 44.7	+61 59.0	60	3 21	///	2 23	2 37	2 55	3 20	60	14.4	14.1	13.8	
				14	Elnath	279 06.9	+28 34.3	S							64	14.5	14.2	13.9	
				47	Eltanin	91 06.6	+51 29.8								68	14.6	14.3	14.1	
				54	Enif	34 29.5	+9 40.6								72	14.7	14.5	14.2	
				56	Fomalhaut	16 11.4	-29 51.4								76	14.8	14.6	14.4	
															80	14.9	14.7	14.6	
				31	Gacrux	172 49.6	-56 51.8	72	13 02	17 57	12 44	11 39	10 34	9 29	84	15.0	14.9	14.7	
				29	Gienah	176 37.0	-17 17.8	70	13 55	17 58	13 13	12 49	11 44	10 39	88	15.1	15.0	14.9	
				35	Hadar	149 49.9	-60 09.6	68	14 27	17 59	13 34	13 26	13 13	12 08	90				
				6	Hamal	328 49.2	+23 15.5	66	14 51	18 01	13 51	13 52	13 55	14 06	Add to table, back cover				
				48	Kaus Aust.	84 41.3	-34 24.5	64	15 09	18 02	14 05	14 12	14 24	14 45	Moon's Upper Limb				
				40	Kochab	137 19.1	+74 20.1	60	15 37	18 05	14 27	14 43	15 04	15 34	Subtract				
				57	Makab	14 21.2	+14 58.3	58	15 47	18 06	14 36	14 55	15 19	15 52	Alt.	12	13	14	
				8	Menkar	314 59.9	+3 55.2	56	15 57	18 08	14 44	15 05	15 32	16 07	0	16.7	17.0	17.3	
				36	Menkent	148 58.9	-36 09.2	54	16 05	18 09	14 51	15 14	15 43	16 19	4	16.7	17.0	17.3	
				24	Miap'dus	221 48.9	-69 31.9	52	16 13	18 11	14 57	15 23	15 53	16 31	8	16.7	17.0	17.3	
								50	16 20	18 12	15 03	15 30	16 02	16 41	12	16.7	16.9	17.2	
				9	Mirfak	309 41.7	+49 42.5	45	16 34	18 15	15 15	15 46	16 21	17 01	16	16.6	16.9	17.2	
				50	Nunki	76 52.0	-26 21.2	40	16 46	18 19	15 25	15 59	16 36	17 18	20	16.6	16.9	17.2	
				52	Peacock	54 27.3	-56 52.8	35	16 56	18 23	15 34	16 10	16 49	17 33	24	16.6	16.8	17.1	
				21	Pollux	244 20.3	+28 07.9	30	17 05	18 27	15 42	16 20	17 01	17 45	28	16.5	16.7	17.0	
				20	Procyon	245 44.7	+5 20.4	20	17 21	18 37	15 55	16 36	17 20	18 06	32	16.4	16.7	16.9	
								10	17 35	18 48	16 07	16 51	17 37	18 25	36	16.4	16.6	16.8	
				46	R'alhague	96 46.8	+12 35.6	0	17 48	19 00	16 18	17 05	17 53	18 42	40	16.3	16.5	16.7	
				26	Regulus	208 29.5	+12 10.9	10	18 01	19 15	16 29	17 19	18 09	18 59	44	16.2	16.4	16.6	
				11	Rigel	281 53.2	-8 15.0	20	18 15	19 35	16 40	17 33	18 26	19 18	48	16.1	16.3	16.4	
				38	Rigel Kent	140 51.5	-60 39.2	30	18 31	20 01	16 54	17 50	18 46	19 39	52	16.1	16.2	16.3	
				44	Sabik	103 02.4	-15 40.3	35	18 41	20 18	17 02	18 00	18 57	19 51	56	16.0	16.1	16.2	
								40	18 52	20 41	17 11	18 12	19 10	20 06	60	15.9	15.9	16.0	
				3	Schedar	350 29.4	+56 18.1	45	19 05	21 10	17 21	18 25	19 26	20 23	64	15.8	15.8	15.9	
				45	Shaula	97 20.9	-37 04.4	50	19 21	21 57	17 34	18 41	19 45	20 44	68	15.7	15.7	15.7	
				18	Sirius	259 11.5	-16 39.1	52	19 28	22 26	17 40	18 49	19 54	20 54	72	15.6	15.6	15.6	
				33	Spica	159 17.1	-10 55.9	54	19 37	///	17 47	18 58	20 05	21 05	76	15.4	15.4	15.4	
				23	Suhail	223 24.2	-43 15.0	56	19 46	///	17 54	19 07	20 16	21 18	80	15.3	15.3	15.2	
								58	19 57	///	18 02	19 18	20 30	21 33	84	15.2	15.1	15.1	
				49	Vega	81 08.5	+38 44.8	60	20 09	///	18 12	19 31	20 45	21 51	88	15.1	15.0	14.9	
				39	Zub'g'bi	137 53.6	-15 51.5	S							90				
															Subtract from table, back cover				

G M T	T GHA	VENUS - 3.3		MARS 2.0		JUPITER - 1.6		SATURN 0.7		MOON			
		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
15	0	53 18.4	163 50.5	-22 40.8	213 39.0	- 7 19.0	261 07.4	+12 18.9	181 36.9	-16 46.8	178 40.2	114	-21 19.5 - 44
	1	68 20.9	178 49.6	41.4	228 40.0	19.6	276 09.6	18.8	196 39.1	46.9	193 10.6	114	21 23.9 - 42
	2	83 23.4	193 48.8	41.9	243 40.9	20.2	291 11.8	18.7	211 41.3	46.9	207 41.0	114	21 28.1 - 42
	3	98 25.8	208 47.9	.. 42.4	258 41.9	.. 20.8	306 14.0	.. 18.6	226 43.4	.. 47.0	222 11.4	114	-21 32.3 - 40
	4	113 28.3	223 47.0	43.0	273 42.8	21.4	321 16.3	18.6	241 45.6	47.1	236 41.8	114	21 36.3 - 39
	5	128 30.8	238 46.2	43.5	288 43.8	22.0	336 18.5	18.5	256 47.7	47.2	251 12.2	113	21 40.2 - 39
	6	143 33.2	253 45.3	-22 44.0	303 44.8	- 7 22.7	351 20.7	+12 18.4	271 49.9	-16 47.2	265 42.5	113	-21 44.1 - 37
	7	158 35.7	268 44.4	44.6	318 45.7	23.3	6 22.9	18.3	286 52.1	47.3	280 12.8	114	21 47.8 - 36
	8	173 38.2	283 43.6	45.1	333 46.7	23.9	21 25.2	18.2	301 54.2	47.4	294 43.2	113	21 51.4 - 35
	9	188 40.6	298 42.7	.. 45.6	348 47.6	.. 24.5	36 27.4	.. 18.2	316 56.4	.. 47.5	309 13.5	113	-21 54.9 - 34
	10	203 43.1	313 41.8	46.1	3 48.6	25.1	51 29.6	18.1	331 58.6	47.5	323 43.8	112	21 58.3 - 33
	11	218 45.6	328 41.0	46.7	18 49.6	25.7	66 31.8	18.0	347 00.7	47.6	338 14.0	113	22 01.6 - 32
	12	233 48.0	343 40.1	-22 47.2	33 50.5	- 7 26.4	81 34.1	+12 17.9	2 02.9	-16 47.7	352 44.3	113	-22 04.8 - 31
	13	248 50.5	358 39.2	47.7	48 51.5	27.0	96 36.3	17.9	17 05.1	47.8	7 14.6	112	22 07.9 - 30
	14	263 52.9	13 38.3	48.2	63 52.4	27.6	111 38.5	17.8	32 07.2	47.8	21 44.8	112	22 10.9 - 29
	15	278 55.4	28 37.5	.. 48.8	78 53.4	.. 28.2	126 40.7	.. 17.7	47 09.4	.. 47.9	36 15.0	113	-22 13.8 - 28
	16	293 57.9	43 36.6	49.3	93 54.4	28.8	141 43.0	17.6	62 11.5	48.0	50 45.3	112	22 16.6 - 26
	17	309 00.3	58 35.7	49.8	108 55.3	29.4	156 45.2	17.5	77 13.7	48.1	65 15.5	112	22 19.2 - 26
	18	324 02.8	73 34.9	-22 50.3	123 56.3	- 7 30.0	171 47.4	+12 17.5	92 15.9	-16 48.1	79 45.7	112	-22 21.8 - 24
	19	339 05.3	88 34.0	50.8	138 57.2	30.7	186 49.6	17.4	107 18.0	48.2	94 15.9	112	22 24.2 - 24
	20	354 07.7	103 33.1	51.3	153 58.2	31.3	201 51.9	17.3	122 20.2	48.3	108 46.1	112	22 26.6 - 22
	21	9 10.2	118 32.2	.. 51.9	168 59.1	.. 31.9	216 54.1	.. 17.2	137 22.4	.. 48.4	123 16.3	112	-22 28.8 - 21
	22	24 12.7	133 31.4	52.4	184 00.1	32.5	231 56.3	17.2	152 24.5	48.4	137 46.5	112	22 30.9 - 20
	23	39 15.1	148 30.5	52.9	199 01.1	33.1	246 58.6	17.1	167 26.7	48.5	152 16.7	112	22 32.9 - 19
16	0	54 17.6	163 29.6	-22 53.4	214 02.0	- 7 33.7	262 00.8	+12 17.0	182 28.8	-16 48.6	166 46.9	111	-22 34.8 - 18
	1	69 20.0	178 28.7	53.9	229 03.0	34.3	277 03.0	16.9	197 31.0	48.7	181 17.0	112	22 36.6 - 17
	2	84 22.5	193 27.9	54.4	244 03.9	35.0	292 05.2	16.9	212 33.2	48.7	195 47.2	112	22 38.3 - 16
	3	99 25.0	208 27.0	.. 54.9	259 04.9	.. 35.6	307 07.5	.. 16.8	227 35.3	.. 48.8	210 17.4	112	-22 39.9 - 15
	4	114 27.4	223 26.1	55.4	274 05.9	36.2	322 09.7	16.7	242 37.5	48.9	224 47.6	111	22 41.4 - 13
	5	129 29.9	238 25.2	55.9	289 06.8	36.8	337 11.9	16.6	257 39.7	49.0	239 17.7	112	22 42.7 - 13
	6	144 32.4	253 24.4	-22 56.4	304 07.8	- 7 37.4	352 14.2	+12 16.6	272 41.8	-16 49.0	253 47.9	112	-22 44.0 - 11
	7	159 34.8	268 23.5	56.9	319 08.7	38.0	7 16.4	16.5	287 44.0	49.1	268 18.1	112	22 45.1 - 11
	8	174 37.3	283 22.6	57.4	334 09.7	38.6	22 18.6	16.4	302 46.1	49.2	282 48.3	112	22 46.2 - 9
	9	189 39.8	298 21.7	.. 57.9	349 10.6	.. 39.3	37 20.9	.. 16.3	317 48.3	.. 49.3	297 18.5	111	-22 47.1 - 8
	10	204 42.2	313 20.8	58.4	4 11.6	39.9	52 23.1	16.2	332 50.5	49.3	311 48.6	112	22 47.9 - 7
	11	219 44.7	328 20.0	58.9	19 12.6	40.5	67 25.3	16.2	347 52.6	49.4	326 18.8	112	22 48.6 - 6
	12	234 47.2	343 19.1	-22 59.4	34 13.5	- 7 41.1	82 27.6	+12 16.1	2 54.8	-16 49.5	340 49.0	112	-22 49.2 - 5
	13	249 49.6	358 18.2	.. 59.9	49 14.5	41.7	97 29.8	16.0	17 57.0	49.6	355 19.2	112	22 49.7 - 4
	14	264 52.1	13 17.3	23 00.4	64 15.4	42.3	112 32.0	15.9	32 59.1	49.6	9 49.4	112	22 50.1 - 3
	15	279 54.5	28 16.4	.. 00.9	79 16.4	.. 42.9	127 34.2	.. 15.9	48 01.3	.. 49.7	24 19.6	113	-22 50.4 - 2
	16	294 57.0	43 15.6	01.4	94 17.3	43.5	142 36.5	15.8	63 03.4	49.8	38 49.9	112	22 50.6 0
	17	309 59.5	58 14.7	01.9	109 18.3	44.2	157 38.7	15.7	78 05.6	49.9	53 20.1	112	22 50.6 0
	18	325 01.9	73 13.8	-23 02.4	124 19.3	- 7 44.8	172 40.9	+12 15.6	93 07.8	-16 49.9	67 50.3	113	-22 50.6 + 2
	19	340 04.4	88 12.9	02.9	139 20.2	45.4	187 43.2	15.6	108 09.9	50.0	82 20.6	112	22 50.4 + 3
	20	355 06.9	103 12.0	03.4	154 21.2	46.0	202 45.4	15.5	123 12.1	50.1	96 50.8	113	22 50.1 + 3
	21	10 09.3	118 11.1	.. 03.8	169 22.1	.. 46.6	217 47.7	.. 15.4	138 14.3	.. 50.2	111 21.1	113	-22 49.8 + 5
	22	25 11.8	133 10.3	04.3	184 23.1	47.2	232 49.9	15.4	153 16.4	50.2	125 51.4	113	22 49.3 + 6
	23	40 14.3	148 09.4	04.8	199 24.0	47.8	247 52.1	15.3	168 18.6	50.3	140 51.7	113	22 48.7 + 7
17	0	55 16.7	163 08.5	-23 05.3	214 25.0	- 7 48.4	262 54.4	+12 15.2	183 20.7	-16 50.4	154 22.0	113	-22 48.0 + 8
	1	70 19.2	178 07.6	05.8	229 25.9	49.1	277 56.6	15.1	198 22.9	50.5	169 22.3	113	22 47.2 + 9
	2	85 21.7	193 06.7	06.2	244 26.9	49.7	292 58.8	15.1	213 25.1	50.5	183 52.6	114	22 46.3 + 10
	3	100 24.1	208 05.8	.. 06.7	259 27.9	.. 50.3	308 01.1	.. 15.0	228 27.2	.. 50.6	198 23.0	114	-22 45.3 + 11
	4	115 26.6	223 04.9	07.2	274 28.8	50.9	323 03.3	14.9	243 29.4	50.7	212 53.4	113	22 44.2 + 13
	5	130 29.0	238 04.1	07.7	289 29.8	51.5	338 05.5	14.8	258 31.6	50.8	227 23.7	114	22 42.9 + 13
	6	145 31.5	253 03.2	-23 08.2	304 30.7	- 7 52.1	353 07.8	+12 14.8	273 33.7	-16 50.8	241 54.1	115	-22 41.6 + 15
	7	160 34.0	268 02.3	08.6	319 31.7	52.7	8 10.0	14.7	288 35.9	50.9	256 24.6	114	22 40.1 + 15
	8	175 36.4	283 01.4	09.1	334 32.6	53.3	23 12.2	14.6	303 38.0	51.0	270 55.0	114	22 38.6 + 17
	9	190 38.9	298 00.5	.. 09.6	349 33.6	.. 54.0	38 14.5	.. 14.5	318 40.2	.. 51.1	285 25.4	115	-22 36.9 + 17
	10	205 41.4	312 59.6	10.0	4 34.5	54.6	53 16.7	14.5	333 42.4	51.1	299 55.9	115	22 35.2 + 19
	11	220 43.8	327 58.7	10.5	19 35.5	55.2	68 19.0	14.4	348 44.5	51.2	314 26.4	115	22 33.3 + 20
	12	235 46.3	342 57.8	-23 11.0	34 36.5	- 7 55.8	83 21.2	+12 14.3	3 46.7	-16 51.3	328 56.9	115	-22 31.3 + 20
	13	250 48.8	357 57.0	11.4	49 37.4	56.4	98 23.4	14.2	18 48.8	51.4	343 27.4	116	22 29.3 + 22
	14	265 51.2	12 56.1	11.9	64 38.4	57.0	113 25.7	14.2	33 51.0	51.4	357 58.0	116	22 27.1 + 23
	15	280 53.7	27 55.2	.. 12.4	79 39.3	.. 57.6	128 27.9	.. 14.1	48 53.2	.. 51.5	12 28.6	116	-22 24.8 + 24
	16	295 56.1	42 54.3	12.8	94 40.3	58.2	143 30.1	14.0	63 55.3	51.6	26 59.2	116	22 22.4 + 25
	17	310 58.6	57 53.4	13.3	109 41.2	58.8	158 32.4	14.0	78 57.5	51.7	41 29.8	117	22 19.9 + 26
	18	326 01.1	72 52.5	-23 13.8	124 42.2	- 7 59.4	173 34.6	+12 13.9	93 59.7	-16 51.7	56 00.5	116	-22 17.3 + 27
	19	341 03.5	87 51.6	14.2	139 43.1	8 00.1	188 36.9	13.8	109 01.8	51.8	70 31.1	117	22 14.6 + 28
	20	356 06.0	102 50.7	14.7	154 44.1	00.7	203 39.1	13.7	124 04.0	51.9	85 01.8	117	22 11.8 + 29
	21	11 08.5	117 49.8	.. 15.1	169 45.0	.. 01.3	218 41.3	.. 13.7	139 06.1	.. 51.9	99 32.5	118	-22 08.9 + 30
	22	26 10.9	132 48.9	15.6	184 46.0	01.9	233 43.6	13.6	154 08.3	52.0	114 03.3	118	22 05.9 + 31
	23	41 13.4	147 48.0	16.1	199 47.0	02.5	248 45.8	13.5	169 10.5	52.1	128 34.1	118	22 02.8 + 32
24		56 15.9	162 47.1	-23 16.5	214 47.9	- 8 03.1	263 48.1	+12 13.5	184 12.6	-16 52.2	143 04.9	118	-21 59.6 + 33
code		-	- 9	- 5	+ 10	- 6	+ 22	- 1	+ 22	- 1			

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS							
	GHA	Dec.	No.	Name	SHA	Dec.								Sun's Low'r Limb	Venus	Mars					
										15	16	17	18				Add	Add	Add		
h	°	'					N	h m	h m	h m	h m	h m	h m	Alt.	°	'	'				
15	0	183 53.1	-18 13.8	7	Acamar	315 50.6	-40 28.8	72	11 10	5 37	■	■	■	■	0						
	1	198 53.0	14.5	5	Achernar	335 58.2	-57 27.6	70	9 51	5 35	■	■	■	■	30	0.5	0.1				
	2	213 52.9	15.1	30	Acrux	173 58.2	-62 51.1	68	9 14	5 34	■	■	■	■	45	0.5	0.1				
	3	228 52.8	15.8	19	Adhara	255 46.2	-28 54.5	66	8 48	5 32	10 50	12 04	12 42	12 56	60	0.5	0.0				
	4	243 52.7	16.4	10	Aldebaran	291 38.6	+16 25.4	64	8 28	5 30	10 11	11 16	11 59	12 24	75	0.5	0.0				
	5	258 52.6	17.1					62	8 12	5 28	9 43	10 45	11 30	12 00	90	0.5	0.0				
	6	273 52.5	-18 17.7	32	Alioth	166 58.9	+56 11.7	60	7 59	5 27	9 22	10 22	11 08	11 41							
	7	288 52.4	18.4	34	Alkaid	153 33.3	+49 31.8	58	7 47	5 25	9 05	10 03	10 50	11 25							
	8	303 52.3	19.0	55	Al Na'ir	28 37.8	-47 10.6	56	7 37	5 24	8 50	9 47	10 35	11 11							
	9	318 52.2	19.7	15	Alnilam	276 29.9	-1 13.6	54	7 28	5 22	8 37	9 34	10 22	11 00							
	10	333 52.1	20.3	25	Alphard	218 38.5	-8 28.0	52	7 20	5 21	8 26	9 22	10 10	10 49							
	11	348 52.0	21.0					50	7 13	5 19	8 17	9 12	10 00	10 40							
	12	3 51.9	-18 21.6	41	Alphecca	126 47.9	+26 51.8	45	6 58	5 15	7 56	8 50	9 39	10 20	Moon's Lower Limb Add						
	13	18 51.8	22.3	1	Alpheratz	358 28.0	+28 51.1	40	6 45	5 10	7 40	8 33	9 21	10 04	Alt.	15	16	17			
	14	33 51.7	22.9	51	Altair	62 50.5	+8 45.2	35	6 35	5 07	7 26	8 18	9 07	9 51	°						
	15	48 51.6	23.5	2	Ankaa	353 57.9	-42 32.7	30	6 25	5 01	7 14	8 06	8 54	9 39	0	12.1	11.9	11.7			
	16	63 51.5	24.2	42	Antares	113 19.6	-26 20.1	20	6 09	4 52	6 53	7 44	8 33	9 19	4	12.1	11.9	11.7			
	17	78 51.4	24.8					10	5 55	4 41	6 35	7 25	8 14	9 01	8	12.2	11.9	11.8			
	18	93 51.3	-18 25.5	37	Arcturus	146 35.4	+19 24.7	0	5 41	4 28	6 18	7 07	7 57	8 45	12	12.2	11.9	11.8			
	19	108 51.2	26.1	43	Atria	109 00.8	-68 57.0	10	5 27	4 13	6 02	6 50	7 39	8 29	16	12.2	12.0	11.9			
	20	123 51.1	26.8	22	Avior	234 35.5	-59 21.8	20	5 13	3 53	5 44	6 31	7 21	8 11	20	12.3	12.1	12.0			
	21	138 51.0	27.4	13	Bellatrix	279 18.0	+6 18.7	30	4 56	3 26	5 23	6 10	6 59	7 51	24	12.4	12.2	12.0			
	22	153 50.9	28.0	16	Betelge'se	271 47.7	+7 24.1	35	4 46	3 08	5 11	5 57	6 46	7 39	28	12.5	12.2	12.1			
	23	168 50.8	28.7					40	4 34	2 45	4 58	5 43	6 32	7 25	32	12.6	12.4	12.2			
16	0	183 50.7	-18 29.3	17	Canopus	264 14.9	-52 40.1	45	4 21	2 15	4 42	5 25	6 15	7 09	36	12.7	12.5	12.4			
	1	198 50.6	30.0	12	Capella	281 37.8	+45 57.3	50	4 04	1 26	4 22	5 04	5 53	6 49	40	12.8	12.6	12.5			
	2	213 50.4	30.6	53	Deneb	50 01.1	+45 07.7	52	3 56	0 52	4 12	4 54	5 43	6 40	44	12.9	12.7	12.6			
	3	228 50.3	31.2	28	Denebola	183 17.8	+14 09.0	54	3 48	///	4 02	4 43	5 32	6 29	48	13.1	12.9	12.8			
	4	243 50.2	31.9	4	Diphda	349 38.9	-18 13.6	56	3 38	///	3 50	4 29	5 19	6 17	52	13.2	13.1	13.0			
	5	258 50.1	32.5					58	3 27	///	3 36	4 14	5 03	6 03	56	13.4	13.2	13.1			
	6	273 50.0	-18 33.1	27	Dubhe	194 44.7	+61 59.0	60	3 14	///	3 20	3 56	4 45	5 46	60	13.5	13.4	13.3			
	7	288 49.9	33.8	14	Elnath	279 06.9	+28 34.3	Lat.		Sunset	Twlt. ends	Moonset				Alt.	15	16	17		
	8	303 49.8	34.4	47	Eltanin	91 06.7	+51 29.8	N	h m	h m	h m	h m	h m	h m	h m	°					
	9	318 49.7	35.0	54	Enif	34 29.5	+9 40.6									0	17.5	17.7	17.7		
	10	333 49.6	35.7	56	Fomalhaut	16 11.4	-29 51.4	72	12 18	17 48	14 06	14 34	15 38	17 04	4	17.5	17.6	17.7			
	11	348 49.5	36.3	31	Gacrux	172 49.5	-56 51.8	70	13 37	17 50	14 45	15 23	16 21	17 36	8	17.5	17.6	17.7			
	12	3 49.4	-18 36.9	29	Gienah	176 37.0	-17 17.8	68	14 14	17 52	15 13	15 54	16 50	18 00	12	17.4	17.6	17.6			
	13	18 49.2	37.6	35	Hadar	149 49.9	-60 09.6	66	14 40	17 54	14 06	14 34	15 38	17 04	16	17.4	17.5	17.6			
	14	33 49.1	38.2	6	Hamal	328 49.2	+23 15.5	64	15 00	17 56	14 45	15 23	16 21	17 36	20	17.3	17.5	17.5			
	15	48 49.0	38.8	48	Kaus Aust.	84 41.4	-34 24.5	62	15 16	17 58	15 13	15 54	16 50	18 00	24	17.2	17.4	17.4			
	16	63 48.9	39.5					60	15 30	18 00	15 34	16 17	17 12	18 18	28	17.2	17.3	17.3			
	17	78 48.8	40.1	40	Kochab	137 19.1	+74 20.1	58	15 42	18 02	15 52	16 35	17 30	18 34	32	17.1	17.2	17.2			
	18	93 48.7	-18 40.7	57	Markab	14 21.2	+14 58.3	56	15 52	18 04	16 07	16 51	17 45	18 47	36	16.9	17.0	17.1			
	19	108 48.6	41.3	8	Menkar	314 59.9	+3 55.2	54	16 00	18 05	16 19	17 04	17 58	18 58	40	16.8	16.9	17.0			
	20	123 48.5	42.0	36	Menkent	148 58.9	-36 09.2	52	16 08	18 06	16 31	17 16	18 09	19 09	44	16.7	16.8	16.8			
	21	138 48.3	42.6	24	Miap'dus	221 48.9	-69 31.9	50	16 16	18 09	16 41	17 26	18 19	19 17	48	16.6	16.6	16.7			
	22	153 48.2	43.2					45	16 31	18 13	17 01	17 48	18 40	19 37	52	16.4	16.5	16.5			
	23	168 48.1	43.8	9	Mirfak	309 41.7	+49 42.5	40	16 44	18 18	17 18	18 05	18 57	19 52	56	16.2	16.3	16.3			
17	0	183 48.0	-18 44.5	50	Nunki	76 52.0	-26 21.2	35	16 54	18 21	17 33	18 20	19 11	20 05	60	16.1	16.1	16.1			
	1	198 47.9	45.1	52	Peacock	54 27.3	-56 52.8	30	17 04	18 27	17 45	18 33	19 24	20 16	64	15.9	15.9	16.0			
	2	213 47.8	45.7	21	Pollux	244 20.3	+28 07.9	20	17 20	18 36	18 06	18 55	19 45	20 36	68	15.7	15.8	15.8			
	3	228 47.7	46.3	20	Procyon	245 44.7	+5 20.3	10	17 35	18 48	18 25	19 14	20 03	20 52	72	15.6	15.6	15.6			
	4	243 47.5	47.0	46	R'alhague	96 46.8	+12 35.6	0	17 48	19 01	18 42	19 31	20 20	21 08	76	15.4	15.4	15.4			
	5	258 47.4	47.6	26	Regulus	208 29.4	+12 10.9	10	18 02	19 17	18 59	19 49	20 37	21 24	80	15.2	15.2	15.2			
	6	273 47.3	-18 48.2	11	Rigel	281 53.2	-8 15.0	20	18 17	19 37	19 18	20 08	20 55	21 40	84	15.0	15.0	14.9			
	7	288 47.2	48.8	38	Rigel Kent.	140 51.5	-60 39.2	30	18 34	20 04	19 39	20 29	21 16	21 59	88	14.9	14.8	14.8			
	8	303 47.1	49.4	44	Sabik	103 02.4	-15 40.3	35	18 44	20 23	19 51	20 42	21 28	22 10	90						
	9	318 46.9	50.1					40	18 56	20 46	20 06	20 57	21 42	22 23							
	10	333 46.8	50.7	3	Schedar	350 29.4	+56 18.1	45	19 09	21 17	20 23	21 14	21 59	22 38							
	11	348 46.7	51.3	45	Shaula	97 20.9	-37 04.4	50	19 26	22 08	20 44	21 35	22 19	22 56							
	12	3 46.6	-18 51.9	18	Sirius	259 11.5	-16 39.2	52	19 34	22 44	20 54	21 46	22 29	23 04							
	13	18 46.5	52.5	33	Spica	159 17.1	-10 55.9	54	19 43	///	21 05	21 57	22 40	23 14							
	14	33 46.4	53.2	23	Suhail	223 24.2	-43 15.0	56	19 53	///	21 18	22 10	22 52	23 25							
	15	48 46.2	53.8					58	20 04	///	21 33	22 26	23 06	23 37							
	16	63 46.1	54.4	49	Vega	81 08.5	+38 44.7	60	20 17	///	21 51	22 44	23 23	23 51							
	17	78 46.0	55.0	39	Zub'g'bi	137 53.6	-15 51.5	G M T		Equation of Time (App.—Mean)				GMT of Transit Meridian of Greenwich				Subtract from table, back cover			

G M T	VENUS -3.3		MARS 2.0		JUPITER -1.7		SATURN 0.7		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
h	o											
18 0	56 15.9	162 47.1 -23 16.5	214 47.9 - 8 03.1	263 48.1 +12 13.5	184 12.6 -16 52.2	143 04.9 118 -21 59.6+ 33						
1 1	71 18.3	177 46.2 17.0	229 48.9 03.7	278 50.3 13.4	199 14.8 52.2	157 35.7 118 21 56.3+ 34						
2 2	86 20.8	192 45.3 17.4	244 49.8 04.3	293 52.6 13.3	214 17.0 52.3	172 06.5 119 21 52.9+ 36						
3 3	101 23.3	207 44.5 17.9	259 50.8 04.9	308 54.8 13.2	229 19.1 52.4	186 37.4 119 21 49.3+ 36						
4 4	116 25.7	222 43.6 18.3	274 51.7 05.5	323 57.0 13.2	244 21.3 52.5	201 08.3 120 21 45.7+ 37						
5 5	131 28.2	237 42.7 18.8	289 52.7 06.2	338 59.3 13.1	259 23.4 52.5	215 39.3 119 21 42.0+ 38						
6 6	146 30.6	252 41.8 -23 19.2	304 53.6 - 8 06.8	354 01.5 +12 13.0	274 25.6 -16 52.6	230 10.2 120 -21 38.2+ 39						
7 7	161 33.1	267 40.9 19.6	319 54.6 07.4	9 03.8 13.0	289 27.8 52.7	244 41.2 121 21 34.3+ 40						
8 8	176 35.6	282 40.0 20.1	334 55.5 08.0	24 06.0 12.9	304 29.9 52.8	259 12.3 120 21 30.3+ 41						
9 9	191 38.0	297 39.1 20.5	349 56.5 08.6	39 08.3 12.8	319 32.1 52.8	273 43.3 121 21 26.2+ 42						
10 10	206 40.5	312 38.2 21.0	4 57.4 09.2	54 10.5 12.7	334 34.3 52.9	288 14.4 121 21 22.0+ 43						
11 11	221 43.0	327 37.3 21.4	19 58.4 09.8	69 12.7 12.7	349 36.4 53.0	302 45.5 122 21 17.7+ 44						
12 12	236 45.4	342 36.4 -23 21.9	34 59.4 - 8 10.4	84 15.0 +12 12.6	4 38.6 -16 53.1	317 16.7 121 -21 13.3+ 45						
13 13	251 47.9	357 35.5 22.3	50 00.3 11.0	99 17.2 12.5	19 40.7 53.1	331 47.8 123 21 08.8+ 46						
14 14	266 50.4	12 34.6 22.7	65 01.3 11.6	114 19.5 12.5	34 42.9 53.2	346 19.1 122 21 04.2+ 47						
15 15	281 52.8	27 33.7 23.2	80 02.2 12.2	129 21.7 12.4	49 45.1 53.3	0 50.3 123 -20 59.5+ 48						
16 16	296 55.3	42 32.8 23.6	95 03.2 12.9	144 24.0 12.3	64 47.2 53.4	15 21.6 123 20 54.7+ 48						
17 17	311 57.8	57 31.9 24.0	110 04.1 13.5	159 26.2 12.2	79 49.4 53.4	29 52.9 123 20 49.9+ 50						
18 18	327 00.2	72 31.0 -23 24.5	125 05.1 - 8 14.1	174 28.5 +12 12.2	94 51.6 -16 53.5	44 24.2 124 -20 44.9+ 51						
19 19	342 02.7	87 30.1 24.9	140 06.0 14.7	189 30.7 12.1	109 53.7 53.6	58 55.6 124 20 39.8+ 51						
20 20	357 05.1	102 29.2 25.3	155 07.0 15.3	204 33.0 12.0	124 55.9 53.7	73 27.0 124 20 34.7+ 53						
21 21	12 07.6	117 28.3 25.8	170 07.9 15.9	219 35.2 12.0	139 58.0 53.7	87 58.4 125 -20 29.4+ 53						
22 22	27 10.1	132 27.4 26.2	185 08.9 16.5	234 37.5 11.9	155 00.2 53.8	102 29.9 125 20 24.1+ 55						
23 23	42 12.5	147 26.5 26.6	200 09.8 17.1	249 39.7 11.8	170 02.4 53.9	117 01.4 125 20 18.6+ 55						
19 0	57 15.0	162 25.6 -23 27.0	215 10.8 - 8 17.7	264 41.9 +12 11.8	185 04.5 -16 54.0	131 32.9 126 -20 13.1+ 56						
1 1	72 17.5	177 24.7 27.5	230 11.7 18.3	279 44.2 11.7	200 06.7 54.0	146 04.5 126 20 07.5+ 57						
2 2	87 19.9	192 23.8 27.9	245 12.7 18.9	294 46.4 11.6	215 08.9 54.1	160 36.1 126 20 01.8+ 58						
3 3	102 22.4	207 22.9 28.3	260 13.6 19.5	309 48.7 11.6	230 11.0 54.2	175 07.7 127 -19 56.0+ 59						
4 4	117 24.9	222 22.0 28.7	275 14.6 20.2	324 50.9 11.5	245 13.2 54.2	189 39.4 127 19 50.1+ 60						
5 5	132 27.3	237 21.1 29.1	290 15.5 20.8	339 53.2 11.4	260 15.3 54.3	204 11.1 128 19 44.1+ 60						
6 6	147 29.8	252 20.2 -23 29.6	305 16.5 - 8 21.4	354 55.4 +12 11.3	275 17.5 -16 54.4	218 42.9 127 -19 38.1+ 62						
7 7	162 32.3	267 19.2 30.0	320 17.4 22.0	9 57.7 11.3	290 19.7 54.5	233 14.6 128 19 31.9+ 62						
8 8	177 34.7	282 18.3 30.4	335 18.4 22.6	24 59.9 11.2	305 21.8 54.5	247 46.4 129 19 25.7+ 63						
9 9	192 37.2	297 17.4 30.8	350 19.3 23.2	40 02.2 11.1	320 24.0 54.6	262 18.3 128 -19 19.4+ 64						
10 10	207 39.6	312 16.5 31.2	5 20.3 23.8	55 04.4 11.1	335 26.1 54.7	276 50.1 130 19 13.0+ 65						
11 11	222 42.1	327 15.6 31.6	20 21.2 24.4	70 06.7 11.0	350 28.3 54.8	291 22.1 129 19 06.5+ 66						
12 12	237 44.6	342 14.7 -23 32.0	35 22.2 - 8 25.0	85 08.9 +12 10.9	5 30.5 -16 54.8	305 54.0 130 -18 59.9+ 67						
13 13	252 47.0	357 13.8 32.5	50 23.1 25.6	100 11.2 10.9	20 32.6 54.9	320 26.0 130 18 53.2+ 67						
14 14	267 49.5	12 12.9 32.9	65 24.1 26.2	115 13.4 10.8	35 34.8 55.0	334 58.0 130 18 46.5+ 69						
15 15	282 52.0	27 12.0 33.3	80 25.0 26.8	130 15.7 10.7	50 37.0 55.1	349 30.0 131 -18 39.6+ 69						
16 16	297 54.4	42 11.1 33.7	95 26.0 27.4	145 18.0 10.7	65 39.1 55.1	4 02.1 131 18 32.7+ 70						
17 17	312 56.9	57 10.2 34.1	110 26.9 28.0	160 20.2 10.6	80 41.3 55.2	18 34.2 131 18 25.7+ 71						
18 18	327 59.4	72 09.3 -23 34.5	125 27.9 - 8 28.6	175 22.5 +12 10.5	95 43.4 -16 55.3	33 06.3 132 -18 18.6+ 71						
19 19	343 01.8	87 08.4 34.9	140 28.8 29.2	190 24.7 10.5	110 45.6 55.4	47 38.5 132 18 11.5+ 73						
20 20	358 04.3	102 07.5 35.3	155 29.8 29.9	205 27.0 10.4	125 47.8 55.4	62 10.7 133 18 04.2+ 73						
21 21	13 06.8	117 06.5 35.7	170 30.7 30.5	220 29.2 10.3	140 49.9 55.5	76 43.0 132 -17 56.9+ 74						
22 22	28 09.2	132 05.6 36.1	185 31.7 31.1	235 31.5 10.3	155 52.1 55.6	91 15.2 133 17 49.5+ 75						
23 23	43 11.7	147 04.7 36.5	200 32.6 31.7	250 33.7 10.2	170 54.3 55.6	105 47.5 134 17 42.0+ 76						
20 0	58 14.1	162 03.8 -23 36.9	215 33.6 - 8 32.3	265 36.0 +12 10.1	185 56.4 -16 55.7	120 19.9 133 -17 34.4+ 76						
1 1	73 16.6	177 02.9 37.3	230 34.5 32.9	280 38.2 10.1	200 58.6 55.8	134 52.2 134 17 26.8+ 78						
2 2	88 19.1	192 02.0 37.7	245 35.5 33.5	295 40.5 10.0	216 00.7 55.9	149 24.6 135 17 19.0+ 78						
3 3	103 21.5	207 01.1 38.1	260 36.4 34.1	310 42.7 9.9	231 02.9 55.9	163 57.1 134 -17 11.2+ 78						
4 4	118 24.0	222 00.2 38.4	275 37.4 34.7	325 45.0 9.9	246 05.1 56.0	178 29.5 135 -17 03.4+ 80						
5 5	133 26.5	236 59.3 38.8	290 38.3 35.3	340 47.3 9.8	261 07.2 56.1	193 02.0 135 16 55.4+ 80						
6 6	148 28.9	251 58.3 -23 39.2	305 39.3 - 8 35.9	355 49.5 +12 9.7	276 09.4 -16 56.2	207 34.5 136 -16 47.4+ 81						
7 7	163 31.4	266 57.4 39.6	320 40.2 36.5	10 51.8 9.7	291 11.6 56.2	222 07.1 136 16 39.3+ 82						
8 8	178 33.9	281 56.5 40.0	335 41.2 37.1	25 54.0 9.6	306 13.7 56.3	236 39.7 136 16 31.1+ 83						
9 9	193 36.3	296 55.6 40.4	350 42.1 37.7	40 56.3 9.5	321 15.9 56.4	251 12.3 136 16 22.8+ 84						
10 10	208 38.8	311 54.7 40.8	5 43.1 38.3	55 58.5 9.5	336 18.0 56.5	265 44.9 137 16 14.5+ 84						
11 11	223 41.2	326 53.8 41.1	20 44.0 38.9	71 00.8 9.4	351 20.2 56.5	280 17.6 137 16 06.1+ 85						
12 12	238 43.7	341 52.9 -23 41.5	35 45.0 - 8 39.5	86 03.1 +12 9.3	6 22.4 -16 56.6	294 50.3 137 -15 57.6+ 85						
13 13	253 46.2	356 51.9 41.9	50 45.9 40.1	101 05.3 9.3	21 24.5 56.7	309 23.0 137 15 49.1+ 87						
14 14	268 48.6	11 51.0 42.3	65 46.9 40.7	116 07.6 9.2	36 26.7 56.7	323 55.7 138 15 40.4+ 86						
15 15	283 51.1	26 50.1 42.7	80 47.8 41.3	131 09.8 9.1	51 28.9 56.8	338 28.5 138 -15 31.8+ 88						
16 16	298 53.6	41 49.2 43.0	95 48.8 41.9	146 12.1 9.1	66 31.0 56.9	353 01.3 139 15 23.0+ 88						
17 17	313 56.0	56 48.3 43.4	110 49.7 42.6	161 14.3 9.0	81 33.2 57.0	7 34.2 138 15 14.2+ 89						
18 18	328 58.5	71 47.4 -23 43.8	125 50.7 - 8 43.2	176 16.6 +12 8.9	96 35.3 -16 57.0	22 07.0 139 -15 05.3+ 90						
19 19	344 01.0	86 46.4 44.2	140 51.6 43.8	191 18.9 8.9	111 37.5 57.1	36 39.9 139 14 56.3+ 91						
20 20	359 03.4	101 45.5 44.5	155 52.6 44.4	206 21.1 8.8	126 39.7 57.2	51 12.8 139 14 47.2+ 91						
21 21	14 05.9	116 44.6 44.9	170 53.5 45.0	221 23.4 8.7	141 41.8 57.3	65 45.7 140 -14 38.1+ 91						
22 22	29 08.4	131 43.7 45.3	185 54.5 45.6	236 25.6 8.7	156 44.0 57.3	80 18.7 140 14 29.0+ 93						
23 23	44 10.8	146 42.8 45.6	200 55.4 46.2	251 27.9 8.6	171 46.2 57.4	94 51.7 140 14 19.7+ 93						
24	59 13.3	161 41.9 -23 46.0	215 56.4 - 8 46.8	266 30.2 +12 8.6	186 48.3 -16 57.5	109 24.7 140 -14 10.4+ 94						
code	-	- 9 - 5	+ 9 - 6	+ 23 0	+ 21 - 1							

G M T	SUN		STARS		Lat.	Sunrise	Twilt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS					
	GHA	Dec.	No.	Name SHA Dec.				18	19	20	21	Alt.	Sun's Low'r Limb	Venus	Mars		
h	°	'	°	'	N	h m	h m	h m	h m	h m	h m	h m	h m	°	'	'	'
18 0	183 45.1	-18 59.3	7	Acamar 315 50.6	-40 28.8	72	10 13	5 47	14 19	13 48	13 30	13 15	13 01	0	0.5	0.1	0.1
1	198 45.0	18 59.9	5	Achernar 335 58.3	-57 27.7	70	10 13	5 44	14 19	13 48	13 30	13 15	13 01	0	0.5	0.1	0.0
2	213 44.9	19 00.5	30	Acrux 173 58.1	-62 51.1	68	9 29	5 41	13 48	13 31	13 22	13 15	13 01	0	0.5	0.1	0.0
3	228 44.8	01.1	19	Adhara 255 46.2	-28 54.5	66	9 00	5 39	12 56	13 01	13 02	13 01	13 01	0	0.5	0.0	0.0
4	243 44.6	01.7	10	Aldebaran 291 38.6	+16 25.4	64	8 38	5 37	12 24	12 38	12 46	12 51	12 41	0	0.5	0.0	0.0
5	258 44.5	02.3				62	8 21	5 35	12 00	12 19	12 32	12 41	12 31	0	0.5	0.0	0.0
6	273 44.4	-19 02.9	32	Alioth 166 58.9	+56 11.7	60	8 06	5 33	11 41	12 04	12 20	12 33	12 26	0	0.5	0.0	0.0
7	288 44.3	03.6	34	Alkaid 153 33.2	+49 31.8	58	7 54	5 31	11 25	11 51	12 11	12 26	12 20	0	0.5	0.0	0.0
8	303 44.1	04.2	55	Al Na'ir 238 37.8	-47 10.6	56	7 43	5 28	11 11	11 40	12 02	12 20	12 14	0	0.5	0.0	0.0
9	318 44.0	04.8	15	Alnilam 276 29.9	-1 13.7	54	7 34	5 27	11 00	11 30	11 54	12 14	12 09	0	0.5	0.0	0.0
10	333 43.9	05.4	25	Alphard 218 38.4	-8 28.0	52	7 26	5 25	10 49	11 21	11 47	12 09	12 04	0	0.5	0.0	0.0
11	348 43.7	06.0				50	7 18	5 22	10 40	11 13	11 41	12 04	11 54	0	0.5	0.0	0.0
12	3 43.6	-19 06.6	41	Alphecca 126 47.9	+26 51.7	45	7 02	5 19	10 20	10 56	11 27	11 54	11 46	0	0.5	0.0	0.0
13	18 43.5	07.2	1	Alpheratz 358 28.0	+28 51.1	40	6 49	5 14	10 04	10 42	11 16	11 46	11 39	0	0.5	0.0	0.0
14	33 43.4	07.8	51	Altair 62 50.5	+8 45.2	35	6 38	5 09	9 51	10 30	11 06	11 39	11 32	0	0.5	0.0	0.0
15	48 43.2	08.4	2	Ankaa 353 57.9	-42 32.7	30	6 28	5 04	9 39	10 20	10 58	11 32	11 25	0	0.5	0.0	0.0
16	63 43.1	09.0	42	Antares 113 19.6	-26 20.1	20	6 11	4 54	9 19	10 02	10 43	11 21	11 12	0	0.5	0.0	0.0
17	78 43.0	09.6				10	5 56	4 42	9 01	9 47	10 30	11 12	11 03	0	0.5	0.0	0.0
18	93 42.8	-19 10.2	37	Arcturus 146 35.4	+19 24.6	0	5 42	4 29	8 45	9 32	10 18	11 03	10 53	0	0.5	0.0	0.0
19	108 42.7	10.8	43	Atria 109 00.8	-68 57.0	10	5 27	4 12	8 29	9 18	10 06	10 53	10 44	0	0.5	0.0	0.0
20	123 42.6	11.4	22	Avior 234 35.5	-59 21.8	20	5 12	3 51	8 11	9 02	9 53	10 44	10 36	0	0.5	0.0	0.0
21	138 42.5	12.0	13	Bellatrix 279 18.0	+6 18.7	30	4 54	3 24	7 51	8 44	9 38	10 32	10 24	0	0.5	0.0	0.0
22	153 42.3	12.6	16	Betelgeuse 271 47.7	+7 24.1	35	4 44	3 06	7 39	8 33	9 29	10 26	10 18	0	0.5	0.0	0.0
23	168 42.2	13.2				40	4 32	2 42	7 25	8 21	9 19	10 19	10 10	0	0.5	0.0	0.0
			17	Canopus 264 14.9	-52 40.1	45	4 18	2 09	7 09	8 07	9 08	10 10	10 01	0	0.5	0.0	0.0
			12	Capella 281 37.8	+45 57.3	50	4 01	1 16	6 49	7 50	8 54	9 59	9 50	0	0.5	0.0	0.0
			53	Deneb 50 01.1	+45 07.7	52	3 52	0 34	6 40	7 42	8 47	9 54	9 45	0	0.5	0.0	0.0
			28	Denebola 183 17.8	+14 49.0	54	3 43	///	6 29	7 32	8 40	9 49	9 40	0	0.5	0.0	0.0
			4	Diphda 349 38.9	-18 13.6	56	3 33	///	6 17	7 22	8 31	9 43	9 34	0	0.5	0.0	0.0
						58	3 21	///	6 03	7 10	8 22	9 36	9 27	0	0.5	0.0	0.0
						60	3 07	///	5 46	6 56	8 11	9 29	9 20	0	0.5	0.0	0.0
			27	Dubhe 194 44.7	+61 59.0	S								0	0.5	0.0	0.0
			14	Elnath 279 06.8	+28 34.3									0	0.5	0.0	0.0
			47	Eltanin 91 06.7	+51 29.8									0	0.5	0.0	0.0
			54	Enif 34 29.5	+9 40.5									0	0.5	0.0	0.0
			56	Fomalhaut 16 11.4	-29 51.4									0	0.5	0.0	0.0
														0	0.5	0.0	0.0
			31	Gacrux 172 49.5	-56 51.8	72	13 17	17 39	17 20	18 49	20 56	21 15	21 05	0	0.5	0.0	0.0
			29	Gienah 176 37.0	-17 17.8	70	13 17	17 43	17 20	19 25	21 15	21 05	20 55	0	0.5	0.0	0.0
			35	Hadar 149 49.9	-60 09.6	68	14 01	17 46	16 12	18 06	19 50	21 29	21 19	0	0.5	0.0	0.0
			6	Hamal 328 49.2	+23 15.5	66	14 30	17 48	17 04	18 36	20 09	21 41	21 31	0	0.5	0.0	0.0
			48	Kaus Aust. 84 41.4	-34 24.5	64	14 52	17 51	17 36	18 59	20 24	21 51	21 41	0	0.5	0.0	0.0
						62	15 09	17 53	18 00	19 17	20 37	21 59	21 49	0	0.5	0.0	0.0
						60	15 24	17 56	18 18	19 31	20 48	22 06	21 56	0	0.5	0.0	0.0
			57	Markab 14 21.2	+14 58.3	58	15 36	17 58	18 34	19 44	20 57	22 12	22 02	0	0.5	0.0	0.0
			8	Menkar 314 59.9	+3 55.2	56	15 47	18 00	18 47	19 55	21 05	22 18	22 08	0	0.5	0.0	0.0
			36	Menkent 148 58.9	-36 09.1	54	15 56	18 02	18 58	20 04	21 13	22 23	22 13	0	0.5	0.0	0.0
			24	Miap'ldus 221 48.8	-69 31.9	52	16 04	18 03	19 09	20 12	21 19	22 27	22 17	0	0.5	0.0	0.0
						50	16 12	18 06	19 17	20 20	21 25	22 31	22 21	0	0.5	0.0	0.0
			9	Mirfak 309 41.7	+49 42.5	45	16 28	18 11	19 37	20 36	21 37	22 40	22 30	0	0.5	0.0	0.0
			50	Nunki 76 52.0	-26 21.2	40	16 41	18 15	19 52	20 49	21 48	22 47	22 37	0	0.5	0.0	0.0
			52	Peacock 54 27.4	-56 52.8	35	16 53	18 21	20 05	21 00	21 57	22 53	22 43	0	0.5	0.0	0.0
			21	Pollux 244 20.2	+28 07.9	30	17 03	18 26	20 16	21 10	22 04	22 59	22 49	0	0.5	0.0	0.0
			20	Procyon 245 44.7	+5 20.3	20	17 20	18 37	20 36	21 27	22 17	23 08	22 58	0	0.5	0.0	0.0
						10	17 35	18 48	20 52	21 41	22 29	23 16	23 06	0	0.5	0.0	0.0
						0	17 49	19 02	21 08	21 54	22 40	23 24	23 14	0	0.5	0.0	0.0
			46	R'alhague 96 46.8	+12 35.6	10	18 03	19 18	21 24	22 08	22 50	23 31	23 21	0	0.5	0.0	0.0
			26	Regulus 208 29.4	+12 10.9	20	18 19	19 40	21 40	22 22	23 02	23 39	23 29	0	0.5	0.0	0.0
			11	Rigel 281 53.2	-8 15.0	20	18 19	19 40	21 40	22 22	23 02	23 39	23 29	0	0.5	0.0	0.0
			38	Rigel Kent. 140 51.5	-60 39.2	30	18 36	20 07	21 59	22 38	23 14	23 48	23 38	0	0.5	0.0	0.0
			44	Sabik 103 02.4	-15 40.3	35	18 47	20 27	22 10	22 48	23 22	23 53	23 43	0	0.5	0.0	0.0
						40	18 59	20 51	22 23	22 58	23 30	23 59	23 49	0	0.5	0.0	0.0
			3	Schedar 350 29.5	+56 18.1	45	19 13	21 24	22 38	23 11	23 40	24 06	23 56	0	0.5	0.0	0.0
			45	Shaula 97 20.9	-37 04.4	50	19 31	22 20	22 56	23 26	23 52	24 14	24 04	0	0.5	0.0	0.0
			18	Sirius 259 11.5	-16 39.2	52	19 39	23 04	23 04	23 33	23 57	24 18	24 08	0	0.5	0.0	0.0
			33	Spica 159 17.0	-10 55.9	54	19 48	///	23 14	23 41	24 03	0 03	0 03	0	0.5	0.0	0.0
			23	Suhail 223 24.2	-43 15.0	56	19 59	///	23 25	23 50	24 10	0 10	0 10	0	0.5	0.0	0.0
						58	20 11	///	23 37	24 00	0 00	0 17	0 17	0	0.5	0.0	0.0
			49	Vega 81 08.5	+38 44.7	60	20 25	///	23 51	24 11	0 11	0 26	0 26	0	0.5	0.0	0.0
			39	Zub'g'bi 137 53.6	-15 51.5	S								0	0.5	0.0	0.0
														0	0.5	0.0	0.0
														0	0.5	0.0	0.0
														0	0.5	0.0	0.0
														0	0.5	0.0	0.0
														0	0.5	0.0	0.0
														0	0.5	0.0	0.0
														0	0.5	0.0	0.0
														0	0.5	0.0	0.0
														0	0.5	0.0	0.0
														0	0.5	0.0	0.0
														0	0.5	0.0	0.0
														0	0.5	0.0	0.0
														0	0.5	0.0	0.0
														0	0.5	0.0	0.0
														0	0.5	0.0	0.0
													</				

G M T	VENUS — 3.3		MARS 1.9		JUPITER — 1.7		SATURN 0.7		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
h	°	°	°	°	°	°	°	°	°	°	°	°
21 0	59 13.3	161 41.9	-23 46.0	215 56.4	- 8 46.8	266 30.2	+12 08.6	186 48.3	-16 57.5	109 24.7	140 -14 10.4	+ 94
1	74 15.7	176 40.9	46.4	230 57.3	47.4	281 32.4	08.5	201 50.5	57.6	123 57.7	140 14 01.0	+ 94
2	89 18.2	191 40.0	46.7	245 58.2	48.0	296 34.7	08.4	216 52.6	57.6	138 30.7	141 13 51.6	+ 95
3	104 20.7	206 39.1	47.1	260 59.2	48.6	311 37.0	08.4	231 54.8	57.7	153 03.8	141 -13 42.1	+ 96
4	119 23.1	221 38.2	47.5	276 00.1	49.2	326 39.2	08.3	246 57.0	57.8	167 36.9	141 13 32.5	+ 96
5	134 25.6	236 37.3	47.8	291 01.1	49.8	341 41.5	08.2	261 59.1	57.8	182 10.0	141 13 22.9	+ 97
6	149 28.1	251 36.3	-23 48.2	306 02.0	- 8 50.4	356 43.7	+12 08.2	277 01.3	-16 57.9	196 43.1	142 -13 13.2	+ 97
7	164 30.5	266 35.4	48.5	321 03.0	51.0	11 46.0	08.1	292 03.5	58.0	211 16.3	141 13 03.5	+ 99
8	179 33.0	281 34.5	48.9	336 03.9	51.6	26 48.3	08.0	307 05.6	58.1	225 49.4	142 12 53.6	+ 98
9	194 35.5	296 33.6	49.2	351 04.9	52.2	41 50.5	08.0	322 07.8	58.1	240 22.6	142 -12 43.8	+ 100
10	209 37.9	311 32.7	49.6	6 05.8	52.8	56 52.8	07.9	337 09.9	58.2	254 55.8	142 12 33.8	+ 100
11	224 40.4	326 31.7	50.0	21 06.8	53.4	71 55.1	07.8	352 12.1	58.3	269 29.0	143 12 23.8	+ 100
12	239 42.9	341 30.8	-23 50.3	36 07.7	- 8 54.0	86 57.3	+12 07.8	7 14.3	-16 58.4	284 02.3	142 -12 13.8	+ 102
13	254 45.3	356 29.9	50.7	51 08.7	54.6	101 59.6	07.7	22 16.4	58.4	298 35.5	143 12 03.6	+ 101
14	269 47.8	11 29.0	51.0	66 09.6	55.2	117 01.9	07.7	37 18.6	58.5	313 08.8	143 11 53.5	+ 103
15	284 50.2	26 28.1	51.3	81 10.5	55.8	132 04.1	07.6	52 20.8	58.6	327 42.1	143 -11 43.2	+ 103
16	299 52.7	41 27.1	51.7	96 11.5	56.4	147 06.4	07.5	67 22.9	58.7	342 15.4	143 11 32.9	+ 103
17	314 55.2	56 26.2	52.0	111 12.4	57.0	162 08.6	07.5	82 25.1	58.7	356 48.7	143 11 22.6	+ 104
18	329 57.6	71 25.3	-23 52.4	126 13.4	- 8 57.6	177 10.9	+12 07.4	97 27.2	-16 58.8	11 22.0	143 -11 12.2	+ 105
19	345 00.1	86 24.4	52.7	141 14.3	58.2	192 13.2	07.3	112 29.4	58.9	25 55.3	143 11 01.7	+ 105
20	0 02.6	101 23.4	53.1	156 15.3	58.8	207 15.4	07.3	127 31.6	58.9	40 28.6	144 10 51.2	+ 106
21	15 05.0	116 22.5	53.4	171 16.2	- 8 59.4	222 17.7	07.2	142 33.7	59.0	55 02.0	143 -10 40.6	+ 106
22	30 07.5	131 21.6	53.8	186 17.2	9 00.0	237 20.0	07.2	157 35.9	59.1	69 35.3	144 10 30.0	+ 107
23	45 10.0	146 20.7	54.1	201 18.1	00.6	252 22.2	07.1	172 38.1	59.2	84 08.7	144 10 19.3	+ 107
22 0	60 12.4	161 19.7	-23 54.4	216 19.1	- 9 01.2	267 24.5	+12 07.0	187 40.2	-16 59.2	98 42.1	144 -10 08.6	+ 108
1	75 14.9	176 18.8	54.8	231 20.0	01.8	282 26.8	07.0	202 42.4	59.3	113 15.5	143 9 57.8	+ 108
2	90 17.3	191 17.9	55.1	246 20.9	02.4	297 29.1	06.9	217 44.5	59.4	127 48.8	144 9 47.0	+ 109
3	105 19.8	206 17.0	55.4	261 21.9	03.0	312 31.3	06.8	232 46.7	59.5	142 22.2	144 9 36.1	+ 109
4	120 22.3	221 16.0	55.8	276 22.8	03.6	327 33.6	06.8	247 48.9	59.5	156 55.6	144 9 25.2	+ 110
5	135 24.7	236 15.1	56.1	291 23.8	04.2	342 35.9	06.7	262 51.0	59.6	171 29.0	144 9 14.2	+ 110
6	150 27.2	251 14.2	-23 56.4	306 24.7	- 9 04.8	357 38.1	+12 06.7	277 53.2	-16 59.7	186 02.4	144 -9 03.2	+ 111
7	165 29.7	266 13.2	56.7	321 25.7	05.4	12 40.4	06.6	292 55.4	59.7	200 35.8	144 8 52.1	+ 112
8	180 32.1	281 12.3	57.1	336 26.6	06.0	27 42.7	06.5	307 57.5	59.8	215 09.2	144 8 40.9	+ 111
9	195 34.6	296 11.4	57.4	351 27.6	06.6	42 44.9	06.5	322 59.7	59.9	229 42.6	145 8 29.8	+ 113
10	210 37.1	311 10.5	57.7	6 28.5	07.2	57 47.2	06.4	338 01.8	17 00.0	244 16.1	144 8 18.5	+ 112
11	225 39.5	326 09.5	58.0	21 29.4	07.8	72 49.5	06.4	353 04.0	00.0	258 49.5	144 8 07.3	+ 113
12	240 42.0	341 08.6	-23 58.4	36 30.4	- 9 08.4	87 51.7	+12 06.3	8 06.2	-17 00.1	273 22.9	144 -7 56.0	+ 114
13	255 44.5	356 07.7	58.7	51 31.3	09.0	102 54.0	06.2	23 08.3	00.2	287 56.3	144 7 44.6	+ 114
14	270 46.9	11 06.8	59.0	66 32.3	09.6	117 56.3	06.2	38 10.5	00.3	302 29.7	144 7 33.2	+ 115
15	285 49.4	26 05.8	59.3	81 33.2	10.2	132 58.6	06.1	53 12.6	00.3	317 03.1	143 7 21.7	+ 115
16	300 51.8	41 04.9	23 59.6	96 34.2	10.8	148 00.8	06.1	68 14.8	00.4	331 36.4	144 7 10.2	+ 115
17	315 54.3	56 04.0	24 00.0	111 35.1	11.4	163 03.1	06.0	83 17.0	00.5	346 09.8	144 6 58.7	+ 116
18	330 56.8	71 03.0	-24 00.3	126 36.0	- 9 12.0	178 05.4	+12 05.9	98 19.1	-17 00.5	0 43.2	144 -6 47.1	+ 116
19	345 59.2	86 02.1	00.6	141 37.0	12.6	193 07.7	05.9	113 21.3	00.6	15 16.6	143 6 35.5	+ 117
20	1 01.7	101 01.2	00.9	156 37.9	13.2	208 09.9	05.8	128 23.5	00.7	29 49.9	144 6 23.8	+ 117
21	16 04.2	116 00.2	01.2	171 38.9	13.8	223 12.2	05.8	143 25.6	00.8	44 23.3	143 6 12.1	+ 117
22	31 06.6	130 59.3	01.5	186 39.8	14.4	238 14.5	05.7	158 27.8	00.8	58 56.6	143 6 00.4	+ 118
23	46 09.1	145 58.4	01.8	201 40.8	15.0	253 16.7	05.6	173 29.9	00.9	73 29.9	144 5 48.6	+ 118
23 0	61 11.6	160 57.4	-24 02.1	216 41.7	- 9 15.6	268 19.0	+12 05.6	188 32.1	-17 01.0	88 03.3	143 -5 36.8	+ 118
1	76 14.0	175 56.5	02.4	231 42.6	16.2	283 21.3	05.5	203 34.3	01.1	102 36.6	142 5 25.0	+ 119
2	91 16.5	190 55.6	02.7	246 43.6	16.8	298 23.6	05.5	218 36.4	01.1	117 09.8	143 5 13.1	+ 120
3	106 18.9	205 54.7	03.0	261 44.5	17.4	313 25.8	05.4	233 38.6	01.2	131 43.1	143 5 01.1	+ 119
4	121 21.4	220 53.7	03.3	276 45.5	18.0	328 28.1	05.3	248 40.8	01.3	146 16.4	142 4 49.2	+ 120
5	136 23.9	235 52.8	03.6	291 46.4	18.6	343 30.4	05.3	263 42.9	01.3	160 49.6	142 4 37.2	+ 121
6	151 26.3	250 51.9	-24 03.9	306 47.3	- 9 19.2	358 32.7	+12 05.2	278 45.1	-17 01.4	175 22.8	142 -4 25.1	+ 120
7	166 28.8	265 50.9	04.2	321 48.3	19.8	13 35.0	05.2	293 47.2	01.5	189 56.0	142 4 13.1	+ 121
8	181 31.3	280 50.0	04.5	336 49.2	20.4	28 37.2	05.1	308 49.4	01.6	204 29.2	142 4 01.0	+ 121
9	196 33.7	295 49.1	04.8	351 50.2	21.0	43 39.5	05.0	323 51.6	01.6	219 02.4	141 3 48.9	+ 122
10	211 36.2	310 48.1	05.1	6 51.1	21.6	58 41.8	05.0	338 53.7	01.7	233 35.5	141 3 36.7	+ 122
11	226 38.7	325 47.2	05.4	21 52.1	22.2	73 44.1	04.9	353 55.9	01.8	248 08.6	141 3 24.5	+ 122
12	241 41.1	340 46.2	-24 05.7	36 53.0	- 9 22.8	88 46.3	+12 04.9	8 58.1	-17 01.9	262 41.7	141 -3 12.3	+ 123
13	256 43.6	355 45.3	06.0	51 53.9	23.4	103 48.6	04.8	24 00.2	01.9	277 14.8	140 3 00.0	+ 122
14	271 46.1	10 44.4	06.3	66 54.9	24.0	118 50.9	04.8	39 02.4	02.0	291 47.8	141 2 47.8	+ 124
15	286 48.5	25 43.4	06.6	81 55.8	24.6	133 53.2	04.7	54 04.6	02.1	306 20.9	139 2 35.4	+ 123
16	301 51.0	40 42.5	06.9	96 56.8	25.2	148 55.5	04.6	69 06.7	02.1	320 53.8	140 2 23.1	+ 123
17	316 53.4	55 41.6	07.2	111 57.7	25.8	163 57.7	04.6	84 08.9	02.2	335 26.8	139 2 10.8	+ 124
18	331 55.9	70 40.6	-24 07.4	126 58.6	- 9 26.4	179 00.0	+12 04.5	99 11.0	-17 02.3	349 59.7	139 -1 58.4	+ 124
19	346 58.4	85 39.7	07.7	141 59.6	27.0	194 02.3	04.5	114 13.2	02.4	4 32.6	139 1 46.0	+ 125
20	2 00.8	100 38.8	08.0	157 00.5	27.5	209 04.6	04.4	129 15.4	02.4	19 05.5	138 1 33.5	+ 124
21	17 03.3	115 37.8	08.3	172 01.5	28.1	224 06.9	04.4	144 17.5	02.5	33 38.3	138 1 21.1	+ 125
22	32 05.8	130 36.9	08.6	187 02.4	28.7	239 09.1	04.3	159 19.7	02.6	48 11.1	138 1 08.6	+ 125
23	47 08.2	145 36.0	08.8	202 03.3	29.3	254 11.4	04.2	174 21.9	02.6	62 43.9	137 0 56.1	+ 125
24	62 10.7	160 35.0	-24 09.1	217 04.3	- 9 29.9	269 13.7	+12 04.2	189 24.0	-17 02.7	77 16.6	137 -0 43.6	+ 126
code	-	- 9	- 3	+ 9	- 6	+ 23	- 1	+ 21	- 1			

G M T	SUN				STARS				Lat.	Sunrise	Twilt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS			
	GHA		Dec.		No.	Name	SHA	Dec.								Alt.	Sun's Low'r Limb	Venus	Mars
	h	m	°	'				N	h	m	h	m	h	m	h				
21	0	183	35.3	-19 41.7	7	Acamar	315 50.6	-40 28.8	72	10 38	5 57	13 51	13 28	13 10	12 52	0	0.5	0.1	0.1
	1	198	35.1	42.3	5	Achernar	335 58.3	-57 27.7	70	9 44	5 52	13 30	13 17	13 06	12 54	30	0.5	0.1	0.0
	2	213	35.0	42.8	30	Acruz	173 58.1	-62 51.1	68	9 11	5 49	13 15	13 08	13 02	12 56	60	0.5	0.1	0.0
	3	228	34.8	43.4	19	Adhara	255 46.2	-28 54.5	66	8 47	5 46	13 01	13 01	12 59	12 58	75	0.5	0.0	0.0
	4	243	34.7	44.0	10	Aldebaran	291 38.6	+16 25.4	64	8 29	5 43	12 51	12 54	12 57	13 00	0			
	5	258	34.5	44.5					62	8 13	5 40	12 41	12 48	12 55	13 01	30			
	6	273	34.4	-19 45.1	32	Alioth	166 58.8	+56 11.7	60	8 00	5 38	12 33	12 43	12 53	13 02	45			
	7	288	34.2	45.7	34	Alkaid	153 33.2	+49 31.8	58	7 49	5 35	12 26	12 39	12 51	13 03	60			
	8	303	34.1	46.2	55	Al Na'ir	28 37.8	-47 10.6	56	7 39	5 33	12 20	12 35	12 50	13 04	75			
	9	318	33.9	46.8	15	Alnilam	276 29.8	-1 13.7	54	7 31	5 32	12 14	12 32	12 49	13 05	90			
	10	333	33.8	47.3	25	Alphard	218 38.4	-8 28.0	52	7 23	5 29	12 09	12 29	12 48	13 06				
	11	348	33.6	47.9					50	7 06	5 27	12 04	12 26	12 46	13 06	Moon's Lower Limb			
	12	3 33.5	-19 48.5	41	Alphecca	126 47.9	+26 51.7	45	6 52	5 22	11 54	12 19	12 44	13 08	Add				
	13	18 33.3	49.0	1	Alpheratz	358 28.0	+28 51.1	40	6 41	5 16	11 46	12 14	12 41	13 09	Alt.	21	22	23	
	14	33 33.2	49.6	51	Altair	62 50.5	+8 45.2	35	6 30	5 12	11 39	12 10	12 40	13 10	0	12.9	13.6	14.5	
	15	48 33.0	50.1	2	Ankaa	353 57.9	-42 32.8	30	6 13	5 06	11 32	12 06	12 38	13 11	4	12.9	13.7	14.5	
	16	63 32.9	50.7	42	Antares	113 19.6	-26 20.1	20	6 13	4 55	11 21	11 59	12 35	13 13	8	12.9	13.7	14.6	
	17	78 32.7	51.2					10	5 57	4 43	11 12	11 52	12 33	13 14	16	13.0	13.7	14.6	
	18	93 32.6	-19 51.8	37	Arcturus	146 35.4	+19 24.6	0	5 42	4 29	11 03	11 47	12 31	13 16	20	13.0	13.8	14.6	
	19	108 32.4	52.4	43	Atria	109 00.8	-68 57.0	10	5 28	4 12	10 53	11 41	12 28	13 17	24	13.1	13.8	14.6	
	20	123 32.2	52.9	22	Avior	234 35.4	-59 21.8	20	5 12	3 51	10 44	11 34	12 26	13 19	28	13.2	13.9	14.7	
	21	138 32.1	53.5	13	Bellatrix	279 18.0	+6 18.7	30	4 53	3 21	10 32	11 27	12 23	13 21	32	13.3	14.0	14.7	
	22	153 31.9	54.0	16	Betel'ge	271 47.7	+7 24.1	35	4 42	3 03	10 26	11 23	12 22	13 22	36	13.4	14.1	14.8	
	23	168 31.8	54.6					40	4 30	2 37	10 19	11 18	12 20	13 23	40	13.7	14.3	14.9	
22	0	183	31.6	-19 55.1	12	Capella	281 37.8	+45 57.3	50	3 57	1 04	9 59	11 07	12 15	13 25	52	13.7	14.3	14.9
	1	198	31.5	55.7	53	Deneb	50 01.1	+45 07.0	52	3 48	0 00	9 54	11 04	12 14	13 27	60	14.0	14.4	15.0
	2	213	31.3	56.2	28	Denebola	183 17.8	+14 49.0	54	3 39	///	9 49	11 00	12 13	13 28	64	14.1	14.5	15.0
	3	228	31.1	56.8	4	Diphda	349 38.9	-18 13.6	56	3 28	///	9 43	10 56	12 12	13 29	68	14.3	14.6	15.1
	4	243	31.0	57.3				58	3 15	///	9 36	10 52	12 10	13 30	72	14.4	14.7	15.1	
	5	258	30.8	57.9	27	Dubhe	194 44.6	+61 59.0	60	3 01	///	9 29	10 48	12 08	13 32	76	14.5	14.8	15.2
	6	273	30.7	-19 58.4	14	Elnath	279 06.8	+28 34.3							80	14.7	14.9	15.2	
	7	288	30.5	59.0	47	Eltanin	91 06.7	+51 29.8							84	14.8	15.0	15.3	
	8	303	30.3	19 59.5	54	Enif	34 29.5	+9 40.5							88	14.9	15.1	15.3	
	9	318	30.2	-20 00.1	56	Fomalhaut	16 11.4	-29 51.4							90	Add to table, back cover			
	10	333	30.0	00.6	31	Gacrux	172 49.5	-56 51.8	72	12 53	17 37	21 15	23 00	24 45	0 45	Moon's Upper Limb			
	11	348	29.9	01.2	29	Gienah	176 36.9	-17 17.8	70	12 53	17 37	21 15	23 00	24 45	0 45	Subtract			
	12	3 29.7	-20 01.7	6	Hamal	328 49.2	+23 15.5	68	13 48	17 40	21 29	23 07	24 45	0 45	Alt.	21	22	23	
	13	18 29.5	02.3	35	Hadar	149 49.8	-60 09.6	66	14 20	17 43	21 41	23 13	24 46	0 46	0	17.1	16.6	16.1	
	14	33 29.4	02.8	48	Kaus Aust.	84 41.4	-34 24.5	64	14 44	17 46	21 51	23 18	24 47	0 47	4	17.0	16.6	16.1	
	15	48 29.2	03.3	40	Kochab	137 19.1	+74 20.0	62	15 03	17 49	21 59	23 22	24 47	0 47	8	17.0	16.6	16.1	
	16	63 29.1	03.9	57	Markab	14 21.3	+14 58.3	60	15 18	17 52	22 06	23 26	24 47	0 47	12	16.9	16.5	16.1	
	17	78 28.9	04.4	8	Menkar	314 59.9	+3 55.2	58	15 31	17 54	22 12	23 29	24 48	0 48	16	16.8	16.4	16.0	
	18	93 28.7	-20 05.0	36	Menkent	148 58.9	-36 09.1	56	15 42	17 56	22 18	23 32	24 48	0 48	20	16.7	16.4	16.0	
	19	108 28.6	05.5	24	Miapl'dus	221 48.8	-69 31.9	54	15 52	17 59	22 23	23 35	24 48	0 48	24	16.6	16.3	16.0	
	20	123 28.4	06.0	9	Mirfak	309 41.7	+49 42.5	52	16 01	18 01	22 27	23 37	24 49	0 49	28	16.5	16.3	15.9	
	21	138 28.2	06.6	50	Nunki	76 52.0	-26 21.2	50	16 09	18 04	22 31	23 39	24 49	0 49	32	16.4	16.2	15.9	
	22	153 28.1	07.1	52	Peacock	54 27.4	-56 52.8	45	16 26	18 09	22 40	23 44	24 49	0 49	36	16.3	16.1	15.8	
	23	168 27.9	07.7	40	Regulus	208 29.4	+12 10.9	40	16 39	18 14	22 47	23 48	24 50	0 50	40	16.2	16.0	15.8	
23	0	183	27.7	-20 08.2	35	54 27.4	-56 52.8	35	16 51	18 19	22 53	23 51	24 50	0 50	44	16.1	15.9	15.8	
	1	198	27.6	08.7	21	Pollux	244 20.2	+28 07.9	30	17 01	18 24	22 59	23 54	24 51	0 51	48	16.0	15.8	15.7
	2	213	27.4	09.3	20	Procyon	245 44.7	+5 20.3	20	17 19	18 36	23 08	23 59	24 51	0 51	52	15.8	15.7	15.6
	3	228	27.2	09.8				10	17 35	18 49	23 16	24 04	0 04	0 52	56	15.7	15.7	15.6	
	4	243	27.1	10.3	46	R'alhague	96 46.8	+12 35.6	0	17 50	19 03	23 24	24 08	0 08	0 52	60	15.6	15.6	15.6
	5	258	26.9	10.9	26	Regulus	208 29.4	+12 10.9	10	18 04	19 20	23 31	24 12	0 12	0 52	64	15.5	15.5	15.5
	6	273	26.7	-20 11.4	11	Rigel	281 53.2	-8 15.0	20	18 20	19 41	23 39	24 16	0 16	0 53	68	15.4	15.4	15.4
	7	288	26.6	11.9	38	Rigel Kent.	140 51.4	-60 39.3	30	18 39	20 11	23 48	24 21	0 21	0 53	72	15.3	15.3	15.3
	8	303	26.4	12.5	44	Sabik	103 02.4	-15 40.2	35	18 50	20 31	23 53	24 24	0 24	0 53	76	15.2	15.2	15.2
	9	318	26.2	13.0				40	19 02	20 56	23 59	24 27	0 27	0 54	80	15.1	15.1	15.1	
	10	333	26.1	13.5	3	Schedar	350 29.5	+56 18.1	45	19 17	21 31	24 06	0 06	0 30	0 54	84	15.0	15.0	15.0
	11	348	25.9	14.1	45	Shaula	97 20.9	-37 04.4	50	19 36	22 33	24 14	0 14	0 34	0 54	88	14.9	14.9	14.9
	12	3 25.7	-20 14.6	18	Sirius	259 11.5	-16 39.2	52	19 44	///	24 18	0 18	0 36	0 55	90	14.8	14.8</		

G M T	T	VENUS — 3.3		MARS 1.9		JUPITER — 1.7		SATURN 0.7		MOON				
		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code	
24	h	o	o	o	o	o	o	o	o	o	o	o	o	
	0	62 10.7	160 35.0	-24 09.1	217 04.3	-9 29.9	269 13.7	+12 04.2	189 24.0	-17 02.7	77 16.6	137 -	0 43.6	+126
	1	77 13.2	175 34.1	09.4	232 05.2	30.5	284 16.0	04.1	204 26.2	02.8	91 49.3	137	0 31.0	+125
	2	92 15.6	190 33.1	09.7	247 06.2	31.1	299 18.3	04.1	219 28.3	02.9	106 22.0	136	0 18.5	+126
	3	107 18.1	205 32.2	09.9	262 07.1	31.7	314 20.5	04.0	234 30.5	02.9	120 54.6	136 -	0 05.9	+126
	4	122 20.6	220 31.3	10.2	277 08.0	32.3	329 22.8	04.0	249 32.7	03.0	135 27.2	135 +	0 06.7	+126
	5	137 23.0	235 30.3	10.5	292 09.0	32.9	344 25.1	03.9	264 34.8	03.1	149 59.7	135	0 19.3	+127
	6	152 25.5	250 29.4	-24 10.7	307 09.9	-9 33.5	359 27.4	+12 03.8	279 37.0	-17 03.1	164 32.2	134 +	0 32.0	+126
	7	167 27.9	265 28.4	11.0	322 10.9	34.1	14 29.7	03.8	294 39.2	03.2	179 04.6	134	0 44.6	+127
	8	182 30.4	280 27.5	11.3	337 11.8	34.7	29 32.0	03.7	309 41.3	03.3	193 37.0	134	0 57.3	+126
	9	197 32.9	295 26.6	11.5	352 12.7	35.3	44 34.2	03.7	324 43.5	03.4	208 09.4	133 -	1 09.9	+127
	10	212 35.3	310 25.6	11.8	7 13.7	35.9	59 36.5	03.6	339 45.6	03.4	222 41.7	133	1 22.6	+127
	11	227 37.8	325 24.7	12.1	22 14.6	36.5	74 38.8	03.6	354 47.8	03.5	237 14.0	132	1 35.3	+127
	12	242 40.3	340 23.8	-24 12.3	37 15.6	-9 37.1	89 41.1	+12 03.5	9 50.0	-17 03.6	251 46.2	132 +	1 48.0	+127
	13	257 42.7	355 22.8	12.6	52 16.5	37.7	104 43.4	03.4	24 52.1	03.7	266 18.4	131	2 00.7	+127
	14	272 45.2	10 21.9	12.9	67 17.4	38.3	119 45.7	03.4	39 54.3	03.7	280 50.5	130	2 13.4	+128
	15	287 47.7	25 20.9	13.1	82 18.4	38.9	134 47.9	03.3	54 56.5	03.8	295 22.5	130 -	2 26.2	+127
	16	302 50.1	40 20.0	13.4	97 19.3	39.4	149 50.2	03.3	69 58.6	03.9	309 54.5	130	2 38.9	+128
	17	317 52.6	55 19.0	13.6	112 20.2	40.0	164 52.5	03.2	85 00.8	03.9	324 26.5	129	2 51.7	+127
	18	332 55.1	70 18.1	-24 13.9	127 21.2	-9 40.6	179 54.8	+12 03.2	100 02.9	-17 04.0	338 58.4	129 +	3 04.4	+128
	19	347 57.5	85 17.2	14.1	142 22.1	41.2	194 57.1	03.1	115 05.1	04.1	353 30.3	127	3 17.2	+127
	20	3 00.0	100 16.2	14.4	157 23.1	41.8	209 59.4	03.1	130 07.3	04.2	8 02.0	128	3 29.9	+128
	21	18 02.4	115 15.3	14.6	172 24.0	42.4	225 01.7	03.0	145 09.4	04.2	22 33.8	126 -	3 42.7	+127
	22	33 04.9	130 14.3	14.9	187 24.9	43.0	240 04.0	02.9	160 11.6	04.3	37 05.4	127	3 55.4	+128
23	48 07.4	145 13.4	15.1	202 25.9	43.6	255 06.2	02.9	175 13.8	04.4	51 37.1	125	4 08.2	+127	
25	0	63 09.8	160 12.5	-24 15.4	217 26.8	-9 44.2	270 08.5	+12 02.8	190 15.9	-17 04.4	66 08.6	125 +	4 20.9	+128
	1	78 12.3	175 11.5	15.6	232 27.7	44.8	285 10.8	02.8	205 18.1	04.5	80 40.1	124	4 33.7	+127
	2	93 14.8	190 10.6	15.9	247 28.7	45.4	300 13.1	02.7	220 20.3	04.6	95 11.5	124	4 46.4	+128
	3	108 17.2	205 09.6	16.1	262 29.6	46.0	315 15.4	02.7	235 22.4	04.7	109 42.9	123 -	4 59.2	+127
	4	123 19.7	220 08.7	16.3	277 30.6	46.6	330 17.7	02.6	250 24.6	04.7	124 14.2	122	5 11.9	+127
	5	138 22.2	235 07.7	16.6	292 31.5	47.2	345 20.0	02.6	265 26.7	04.8	138 45.4	121	5 24.6	+128
	6	153 24.6	250 06.8	-24 16.8	307 32.4	-9 47.7	0 22.3	+12 02.5	280 28.9	-17 04.9	153 16.5	121 +	5 37.4	+127
	7	168 27.1	265 05.9	17.1	322 33.4	48.3	15 24.6	02.5	295 31.1	04.9	167 47.6	121	5 50.1	+127
	8	183 29.6	280 04.9	17.3	337 34.3	48.9	30 26.8	02.4	310 33.2	05.0	182 18.7	119	6 02.8	+127
	9	198 32.0	295 04.0	17.5	352 35.2	49.5	45 29.1	02.4	325 35.4	05.1	196 49.6	119 -	6 15.5	+126
	10	213 34.5	310 03.0	17.8	7 36.2	50.1	60 31.4	02.3	340 37.6	05.2	211 20.5	118	6 28.1	+127
	11	228 36.9	325 02.1	18.0	22 37.1	50.7	75 33.7	02.2	355 39.7	05.2	225 51.3	117	6 40.8	+127
	12	243 39.4	340 01.1	-24 18.2	37 38.0	-9 51.3	90 36.0	+12 02.2	10 41.9	-17 05.3	240 22.0	117 +	6 53.5	+126
	13	258 41.9	355 00.2	18.5	52 39.0	51.9	105 38.3	02.1	25 44.0	05.4	254 52.7	116	7 06.1	+126
	14	273 44.3	9 59.2	18.7	67 39.9	52.5	120 40.6	02.1	40 46.2	05.4	269 23.3	115	7 18.7	+126
	15	288 46.8	24 58.3	18.9	82 40.9	53.1	135 42.9	02.0	55 48.4	05.5	283 53.8	114 -	7 31.3	+126
	16	303 49.3	39 57.4	19.1	97 41.8	53.7	150 45.2	02.0	70 50.5	05.6	298 24.2	113	7 43.9	+125
	17	318 51.7	54 56.4	19.4	112 42.7	54.3	165 47.5	01.9	85 52.7	05.7	312 54.5	113	7 56.4	+126
	18	333 54.2	69 55.5	-24 19.6	127 43.7	-9 54.8	180 49.8	+12 01.9	100 54.9	-17 05.7	327 24.8	112 +	8 09.0	+125
	19	348 56.7	84 54.5	19.8	142 44.6	55.4	195 52.1	01.8	115 57.0	05.8	341 55.0	111	8 21.5	+125
	20	3 59.1	99 53.6	20.0	157 45.5	56.0	210 54.3	01.8	130 59.2	05.9	356 25.1	110	8 34.0	+124
	21	19 01.6	114 52.6	20.2	172 46.5	56.6	225 56.6	01.7	146 01.4	05.9	10 55.1	109 -	8 46.4	+124
	22	34 04.0	129 51.7	20.5	187 47.4	57.2	240 58.9	01.7	161 03.5	06.0	25 25.0	109	8 58.8	+124
	23	49 06.5	144 50.7	20.7	202 48.3	57.8	256 01.2	01.6	176 05.7	06.1	39 54.9	107	9 11.2	+124
26	0	64 09.0	159 49.8	-24 20.9	217 49.3	-9 58.4	271 03.5	+12 01.6	191 07.8	-17 06.2	54 24.6	107 +	9 23.6	+123
	1	79 11.4	174 48.8	21.1	232 50.2	59.0	286 05.8	01.5	206 10.0	06.2	68 54.3	106	9 35.9	+123
	2	94 13.9	189 47.9	21.3	247 51.1	59.6	301 08.1	01.5	221 12.2	06.3	83 23.9	105	9 48.2	+123
	3	109 16.4	204 46.9	21.5	262 52.1	-10 00.2	316 10.4	01.4	236 14.3	06.4	97 53.4	104 -	10 00.5	+122
	4	124 18.8	219 46.0	21.7	277 53.0	00.8	331 12.7	01.4	251 16.5	06.4	112 22.8	103	10 12.7	+122
	5	139 21.3	234 45.0	22.0	292 53.9	01.3	346 15.0	01.3	266 18.7	06.5	126 52.1	102	10 24.9	+122
	6	154 23.8	249 44.1	-24 22.2	307 54.9	-10 01.9	1 17.3	+12 01.3	281 20.8	-17 06.6	141 21.3	102	+10 37.1	+121
	7	169 26.2	264 43.1	22.4	322 55.8	02.5	16 19.6	01.2	296 23.0	06.7	155 50.5	100	10 49.2	+121
	8	184 28.7	279 42.2	22.6	337 56.7	03.1	31 21.9	01.2	311 25.2	06.7	170 19.5	100	11 01.3	+120
	9	199 31.2	294 41.2	22.8	352 57.7	03.7	46 24.2	01.1	326 27.3	06.8	184 48.5	98 -	11 13.3	+120
	10	214 33.6	309 40.3	23.0	7 58.6	04.3	61 26.5	01.0	341 29.5	06.9	199 17.3	98	11 25.3	+119
	11	229 36.1	324 39.4	23.2	22 59.5	04.9	76 28.8	01.0	356 31.6	06.9	213 46.1	97	11 37.2	+119
	12	244 38.5	339 38.4	-24 23.4	38 00.5	-10 05.9	91 31.1	+12 00.9	11 33.8	-17 07.0	228 14.8	95	+11 49.1	+118
	13	259 41.0	354 37.5	23.6	53 01.4	06.1	106 33.4	00.9	26 36.0	07.1	242 43.3	95	12 00.9	+118
	14	274 43.5	9 36.5	23.8	68 02.3	06.6	121 35.7	00.8	41 38.1	07.2	257 11.8	94	12 12.7	+117
	15	289 45.9	24 35.6	24.0	83 03.3	07.2	136 38.0	00.8	56 40.3	07.2	271 40.2	92	12 24.4	+117
	16	304 48.4	39 34.6	24.2	98 04.2	07.8	151 40.3	00.7	71 42.5	07.3	286 08.4	92	12 36.1	+116
	17	319 50.9	54 33.7	24.4	113 05.1	08.4	166 42.6	00.7	86 44.6	07.4	300 36.6	91	12 47.7	+116
	18	334 53.3	69 32.7	-24 24.6	128 06.1	-10 09.0	181 44.9	+12 00.6	101 46.8	-17 07.4	315 04.7	89	+12 59.3	+115
	19	349 55.8	84 31.8	24.7	143 07.0	09.6	196 47.2	00.6	116 48.9	07.5	329 32.6	89	13 10.8	+114
	20	4 58.3	99 30.8	24.9	158 07.9	10.2	211 49.5	00.5	131 51.1	07.6	344 00.5	88	13 22.2	+114

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS			
	GHA	Dec.	No.	Name	SHA	Dec.								Alt.	Sun's Lower Limb Add	Venus Add	Mars Add
										24	25	26	27				
24	0	183 23.7 -20 20.9	7	Acamar	315 50.6 -40 28.8	72	6 05	12 52	12 33	12 09	11 30						
	1	198 23.5 21.4	5	Achernar	335 58.3 -57 27.7	70	11 16	6 00	12 54	12 42	12 29	12 09					
	2	213 23.3 21.9	30	Acrux	173 58.0 -62 51.1	68	9 59	5 56	12 56	12 50	12 44	12 37					
	3	228 23.1 22.4	19	Adhara	255 46.1 -28 54.6	66	9 22	5 53	12 58	12 57	12 57	12 58					
	4	243 23.0 23.0	10	Aldebaran	291 38.6 +16 25.4	64	8 57	5 50	13 00	13 03	13 07	13 15					
	5	258 22.8 23.5				62	8 37	5 46	13 01	13 08	13 16	13 29	0	0.5	0.1		
	6	273 22.6 -20 24.0	32	Alioth	166 58.8 +56 11.7	60	8 20	5 43	13 02	13 12	13 24	13 41	30	0.5	0.1		
	7	288 22.4 24.5	34	Alkaid	153 33.2 +49 31.8	58	8 07	5 41	13 03	13 16	13 31	13 51	45	0.5	0.1		
	8	303 22.3 25.0	55	Al Na'ir	28 37.8 -47 10.6	56	7 55	5 38	13 04	13 19	13 37	14 00	70	0.5	0.0		
	9	318 22.1 25.5	15	Alnilam	276 29.8 -1 13.7	54	7 45	5 36	13 05	13 22	13 43	14 08	90	0.5	0.0		
	10	333 21.9 26.1	25	Alphard	218 38.4 -8 28.0	52	7 35	5 33	13 06	13 25	13 48	14 16					
	11	348 21.7 26.6				50	7 27	5 31	13 06	13 28	13 52	14 22	Moon's Lower Limb				
	12	3 21.6 -20 27.1	41	Alphecca	126 47.9 +26 51.7	45	7 10	5 25	13 08	13 33	14 02	14 36	Add				
	13	18 21.4 27.6	1	Alpheratz	358 28.0 +28 51.1	40	6 56	5 19	13 09	13 38	14 11	14 48	Alt.	24	25	26	
	14	33 21.2 28.1	51	Altair	62 50.5 +8 45.2	35	6 43	5 13	13 10	13 42	14 18	14 58	0				
	15	48 21.0 28.6	2	Ankaa	353 57.9 -42 32.8	30	6 33	5 08	13 11	13 46	14 24	15 07	4	15.7	16.9	18.1	
	16	63 20.9 29.1	42	Antares	113 19.6 -26 20.1	20	6 14	4 57	13 13	13 52	14 35	15 22	8	15.7	16.9	18.1	
	17	78 20.7 29.7				10	5 58	4 44	13 14	13 58	14 45	15 36	12	15.7	16.9	18.1	
	18	93 20.5 -20 30.2	37	Arcturus	146 35.4 +19 24.6	0	5 43	4 30	13 16	14 03	14 54	15 49	16	15.7	16.9	18.0	
	19	108 20.3 30.7	43	Atria	109 00.8 -68 57.0	10	5 28	4 12	13 17	14 09	15 03	16 01	20	15.7	16.9	18.0	
	20	123 20.1 31.2	22	Avior	234 35.4 -59 21.8	20	5 11	3 50	13 19	14 14	15 13	16 15	24	15.7	16.9	18.0	
	21	138 20.0 31.7	13	Bellatrix	279 18.0 +6 18.7	30	4 52	3 20	13 21	14 21	15 24	16 31	28	15.7	16.8	17.9	
	22	153 19.8 32.2	16	Betelge'se	271 47.7 +7 24.0	35	4 41	3 00	13 22	14 25	15 31	16 40	32	15.7	16.8	17.8	
	23	168 19.6 32.7				40	4 28	2 34	13 23	14 29	15 39	16 51	36	15.7	16.8	17.8	
			17	Canopus	264 14.8 -52 40.1	45	4 13	1 58	13 25	14 34	15 48	17 03	40	15.7	16.7	17.7	
25	0	183 19.4 -20 33.2	12	Capella	281 37.8 +45 57.3	50	3 54	0 52	13 27	14 41	15 58	17 19	44	15.7	16.7	17.6	
	1	198 19.2 33.7	53	Deneb	50 01.1 +45 07.7	52	3 45	///	13 27	14 43	16 03	17 26	48	15.6	16.6	17.5	
	2	213 19.0 34.2	28	Denebola	183 17.7 +14 49.0	54	3 35	///	13 28	14 47	16 09	17 34	52	15.6	16.6	17.4	
	3	228 18.9 34.7	4	Diphda	349 38.9 -18 13.6	56	3 24	///	13 29	14 50	16 15	17 43	56	15.6	16.5	17.3	
	4	243 18.7 35.2				58	3 11	///	13 30	14 54	16 22	17 53	60	15.6	16.4	17.2	
	5	258 18.5 35.7	27	Dubhe	194 44.6 +61 59.0	60	2 55	///	13 32	14 59	16 30	18 05	64	15.6	16.4	17.0	
	6	273 18.3 -20 36.2	14	Elnath	279 06.8 +28 34.3	S							68	15.6	16.3	16.9	
	7	288 18.1 36.7	47	Eltanin	91 06.7 +51 29.8								72	15.6	16.2	16.8	
	8	303 18.0 37.2	54	Enif	34 29.5 +9 40.5								76	15.6	16.2	16.6	
	9	318 17.8 37.7	56	Fomalhaut	16 11.4 -29 51.4								80	15.6	16.1	16.5	
	10	333 17.6 38.2				N							84	15.6	16.0	16.4	
	11	348 17.4 38.7	31	Gacrux	172 49.4 -56 51.8	72	12 17	17 25	0 44	2 40	4 47	7 18	88	15.6	15.9	16.2	
	12	3 17.2 -20 39.2	29	Gienah	176 36.9 -17 17.8	70	12 17	17 31	0 45	2 33	4 29	6 40	90	15.6	15.9	16.1	
	13	18 17.0 39.7	35	Hadar	149 49.8 -60 09.5	68	13 34	17 35	0 45	2 27	4 16	6 14	Add to table, back cover				
	14	33 16.8 40.2	6	Hamal	328 49.2 +23 15.5	66	14 11	17 39	0 46	2 23	4 05	5 54	Moon's Upper Limb				
	15	48 16.7 40.7	48	Kaus Aust.	84 41.4 -34 24.4	64	14 36	17 42	0 47	2 19	3 55	5 38	Subtract				
	16	63 16.5 41.2				62	14 56	17 45	0 47	2 15	3 48	5 25	Alt.	24	25	26	
	17	78 16.3 41.7	40	Kochab	137 19.1 +74 20.0	60	15 13	17 49	0 47	2 12	3 41	5 14	0				
	18	93 16.1 -20 42.2	57	Markab	14 21.3 +14 58.3	58	15 26	17 51	0 48	2 09	3 35	5 04	4	15.5	14.8	14.1	
	19	108 15.9 42.7	8	Menkar	314 59.9 +3 55.2	56	15 38	17 54	0 48	2 07	3 30	4 56	8	15.5	14.8	14.1	
	20	123 15.7 43.2	36	Menkent	148 58.9 -36 09.1	54	15 49	17 57	0 48	2 05	3 25	4 49	12	15.5	14.8	14.1	
	21	138 15.5 43.7	24	Miapl'dus	221 48.7 -69 31.9	52	15 58	17 59	0 49	2 03	3 21	4 42	16	15.5	14.8	14.2	
	22	153 15.3 44.2				50	16 06	18 01	0 49	2 01	3 17	4 36	20	15.5	14.8	14.2	
	23	168 15.2 44.6	9	Mirfak	309 41.7 +49 42.5	45	16 24	18 08	0 49	1 58	3 09	4 23	24	15.5	14.9	14.3	
			50	Nunki	76 52.0 -26 21.2	40	16 38	18 13	0 50	1 54	3 02	4 13	28	15.5	14.9	14.4	
26	0	183 15.0 -20 45.1	52	Peacock	54 27.4 -56 52.8	35	16 50	18 19	0 50	1 52	2 56	4 04	32	15.5	14.9	14.4	
	1	198 14.8 45.6	21	Pollux	244 20.2 +28 07.9	30	17 01	18 25	0 51	1 49	2 51	3 56	36	15.5	15.0	14.5	
	2	213 14.6 46.1	20	Procyon	245 44.6 +5 20.3	20	17 19	18 36	0 51	1 45	2 42	3 42	40	15.5	15.0	14.6	
	3	228 14.4 46.6				10	17 35	18 49	0 52	1 41	2 34	3 30	44	15.5	15.1	14.7	
	4	243 14.2 47.1	46	R'alhague	96 46.8 +12 35.6	0	17 51	19 05	0 52	1 38	2 27	3 19	48	15.5	15.1	14.8	
	5	258 14.0 47.6	26	Regulus	208 29.4 +12 10.9	10	18 06	19 22	0 52	1 35	2 19	3 08	52	15.5	15.2	14.9	
	6	273 13.8 -20 48.1	11	Rigel	281 53.2 -8 15.0	20	18 22	19 44	0 53	1 31	2 12	2 57	56	15.5	15.3	15.0	
	7	288 13.6 48.5	38	Rigel Kent.	140 51.4 -60 39.2	30	18 41	20 14	0 53	1 27	2 03	2 43	60	15.5	15.4	15.1	
	8	303 13.4 49.0	44	Sabik	103 02.4 -15 40.3	35	18 53	20 35	0 53	1 24	1 58	2 35	64	15.5	15.5	15.2	
	9	318 13.3 49.5				40	19 06	21 01	0 54	1 22	1 52	2 27	68	15.5	15.5	15.3	
	10	333 13.1 50.0	3	Schedar	350 29.5 +56 18.1	45	19 21	21 38	0 54	1 19	1 46	2 17	72	15.5	15.5	15.4	
	11	348 12.9 50.5	45	Shaula	97 20.9 -37 04.4	50	19 40	22 46	0 54	1 15	1 38	2 04	76	15.6	15.6	15.7	
	12	3 12.7 -20 51.0	18	Sirius	259 11.5 -16 39.2	52	19 49	///	0 55	1 13	1 34	1 59	80	15.6	15.7	15.8	
	13	18 12.5 51.4	33	Spica	159 17.0 -10 55.9	54	19 59	///	0 55	1 11	1 30	1 52	84	15.6	15.8	16.0	
	14	33 12.3 51.9	23	Suhail	223 24.1 -43 15.1	56	20 11	///	0 55	1 09	1 26	1 45	88	15.6	15.8	16.1	
	15	48 12.1 52.4				58	20 24	///	0 55	1 07	1 21	1 38	90	Subtract from table, back cover			
	16	63 11.9 52.9	49	Vega	81 08.5 +38 44.7	60	20 40	///	0 55	1 04	1 15	1 29					
	17	78 11.7 53.4	39	Zub'g'bi	137 53.5 -15 51.5	S											
	18	93 11.5 -20 53.8															
	19	108 11.3 54.3															

G M T	T GHA	VENUS - 3.3		MARS 1.9		JUPITER - 1.7		SATURN 0.7		MOON			
		GHA	Dec	GHA	Dec	GHA	Dec	GHA	Dec	GHA	code	Dec.	code
27	0	65 08.1	159 27.0	-24 25.7	218 11.7	-10 12.5	271 58.7	+12 00.3	191 59.8	-17 07.9	41 51.0	83	+14 07.3 +111
	1	80 10.6	174 26.1	25.9	233 12.6	13.1	287 01.0	00.3	207 01.9	07.9	56 18.3	83	14 18.4 +111
	2	95 13.0	189 25.1	26.0	248 13.5	13.7	302 03.3	00.2	222 04.1	08.0	70 45.6	81	14 29.5 +109
	3	110 15.5	204 24.1	26.2	263 14.5	14.3	317 05.6	00.2	237 06.3	08.1	85 12.7	81	14 40.4 +109
	4	125 18.0	219 23.2	26.4	278 15.4	14.9	332 07.9	00.2	252 08.4	08.2	99 39.8	79	14 51.3 +108
	5	140 20.4	234 22.2	26.6	293 16.3	15.5	347 10.2	00.1	267 10.6	08.2	114 06.7	78	15 02.1 +107
	6	155 22.9	249 21.3	-24 26.8	308 17.3	-10 16.0	2 12.5	+12 00.1	282 12.7	-17 08.3	128 33.5	77	+15 12.8 +107
	7	170 25.4	264 20.3	26.9	323 18.2	16.6	17 14.8	00.0	297 14.9	08.4	143 00.2	77	15 23.5 +106
	8	185 27.8	279 19.4	27.1	338 19.1	17.2	32 17.1	12 00.0	312 17.1	08.4	157 26.9	75	15 34.1 +105
	9	200 30.3	294 18.4	27.3	353 20.0	17.8	47 19.4	-11 59.9	327 19.2	08.5	171 53.4	74	15 44.6 +104
	10	215 32.8	309 17.5	27.5	8 21.0	18.4	62 21.7	59.9	342 21.4	08.6	186 19.8	73	15 55.0 +103
	11	230 35.2	324 16.5	27.6	23 21.9	19.0	77 24.0	59.8	357 23.6	08.6	200 46.1	72	16 05.3 +102
	12	245 37.7	339 15.6	-24 27.8	38 22.8	-10 19.6	92 26.3	+11 59.8	12 25.7	-17 08.7	215 12.3	70	+16 15.5 +101
	13	260 40.1	354 14.6	28.0	53 23.8	20.2	107 28.6	59.7	27 27.9	08.8	229 38.3	70	16 25.6 +101
	14	275 42.6	9 13.7	28.1	68 24.7	20.7	122 30.9	59.7	42 30.1	08.9	244 04.3	69	16 35.7 + 99
	15	290 45.1	24 12.7	28.3	83 25.6	21.3	137 33.3	59.6	57 32.2	08.9	258 30.2	68	16 45.6 + 99
	16	305 47.5	39 11.8	28.5	98 26.6	21.9	152 35.6	59.6	72 34.4	09.0	272 56.0	66	17 55.5 + 97
	17	320 50.0	54 10.8	28.6	113 27.5	22.5	167 37.9	59.5	87 36.6	09.1	287 21.6	66	17 05.2 + 97
	18	335 52.5	69 09.9	-24 28.8	128 28.4	-10 23.1	182 40.2	+11 59.5	102 38.7	-17 09.1	301 47.2	64	+17 14.9 + 95
	19	350 54.9	84 08.9	28.9	143 29.4	23.7	197 42.5	59.4	117 40.9	09.2	316 12.6	63	17 24.4 + 95
	20	5 57.4	99 08.0	29.1	158 30.3	24.3	212 44.8	59.4	132 43.0	09.3	330 37.9	63	17 33.9 + 93
	21	20 59.9	114 07.0	29.3	173 31.2	24.8	227 47.1	59.3	147 45.2	09.4	345 03.2	61	17 43.2 + 92
	22	36 02.3	129 06.1	29.4	188 32.1	25.4	242 49.4	59.3	162 47.4	09.4	359 28.3	60	17 52.4 + 91
	23	51 04.8	144 05.1	29.6	203 33.1	26.0	257 51.7	59.2	177 49.5	09.5	13 53.3	59	18 01.5 + 91
28	0	66 07.3	159 04.1	-24 29.7	218 34.0	-10 26.6	272 54.0	+11 59.2	192 51.7	-17 09.6	28 18.2	58	+18 10.6 + 89
	1	81 09.7	174 03.2	29.9	233 34.9	27.2	287 56.3	59.1	207 53.9	09.6	42 43.0	57	18 19.5 + 88
	2	96 12.2	189 02.2	30.0	248 35.9	27.8	302 58.6	59.1	222 56.0	09.7	57 07.7	56	18 28.3 + 86
	3	111 14.6	204 01.3	30.2	263 36.8	28.3	318 00.9	59.1	237 58.2	09.8	71 32.3	55	18 36.9 + 86
	4	126 17.1	219 00.3	30.3	278 37.7	28.9	333 03.3	59.0	253 00.4	09.8	85 56.8	54	18 45.5 + 84
	5	141 19.6	233 59.4	30.5	293 38.6	29.5	348 05.6	59.0	268 02.5	09.9	100 21.2	53	18 53.9 + 83
	6	156 22.0	248 58.4	-24 30.6	308 39.6	-10 30.1	3 07.9	+11 58.9	283 04.7	-17 10.0	114 45.5	52	+19 02.2 + 82
	7	171 24.5	263 57.5	30.8	323 40.5	30.7	18 10.2	58.9	298 06.9	10.1	129 09.7	51	19 10.4 + 81
	8	186 27.0	278 56.5	30.9	338 41.4	31.3	33 12.5	58.8	313 09.0	10.1	143 33.8	50	19 18.5 + 79
	9	201 29.4	293 55.6	31.0	353 42.4	31.8	48 14.8	58.8	328 11.2	10.2	157 57.8	49	19 26.4 + 78
	10	216 31.9	308 54.6	31.2	8 43.3	32.4	63 17.1	58.7	343 13.3	10.3	172 21.7	48	19 34.2 + 77
	11	231 34.4	323 53.6	31.3	23 44.2	33.0	78 19.4	58.7	358 15.5	10.3	186 45.5	47	19 41.9 + 76
	12	246 36.8	338 52.7	-24 31.5	38 45.1	-10 33.6	93 21.7	+11 58.6	13 17.7	-17 10.4	201 09.2	46	+19 49.5 + 74
	13	261 39.3	353 51.7	31.6	53 46.1	34.2	108 24.1	58.6	28 19.8	10.5	215 32.8	46	19 56.9 + 72
	14	276 41.8	8 50.8	31.7	68 47.0	34.8	123 26.4	58.6	43 22.0	10.6	229 56.4	44	20 04.1 + 72
	15	291 44.2	23 49.8	31.9	83 47.9	35.3	138 28.7	58.5	58 24.2	10.6	244 19.8	43	20 11.3 + 70
	16	306 46.7	38 48.9	32.0	98 48.9	35.9	153 31.0	58.5	73 26.3	10.7	258 43.1	43	20 18.3 + 69
	17	321 49.1	53 47.9	32.1	113 49.8	36.5	168 33.3	58.4	88 28.5	10.8	273 06.4	41	20 25.2 + 67
	18	336 51.6	68 47.0	-24 32.3	128 50.7	-10 37.1	183 35.6	+11 58.4	103 30.7	-17 10.8	287 29.5	41	+20 31.9 + 66
	19	351 54.1	83 46.0	32.4	143 51.6	37.7	198 37.9	58.3	118 32.8	10.9	301 52.6	39	20 38.5 + 64
	20	6 56.5	98 45.0	32.5	158 52.6	38.3	213 40.3	58.3	133 35.0	11.0	316 15.5	39	20 44.9 + 63
	21	21 59.0	113 44.1	32.6	173 53.5	38.8	228 42.6	58.2	148 37.2	11.0	330 38.4	39	20 51.2 + 61
	22	37 01.5	128 43.1	32.8	188 54.4	39.4	243 44.9	58.2	163 39.3	11.1	345 01.3	37	20 57.3 + 60
	23	52 03.9	143 42.2	32.9	203 55.3	40.0	258 47.2	58.1	178 41.5	11.2	359 24.0	36	21 03.3 + 59
29	0	67 06.4	158 41.2	-24 33.0	218 56.3	-10 40.6	273 49.5	+11 58.1	193 43.6	-17 11.3	13 46.6	36	+21 09.2 + 57
	1	82 08.9	173 40.3	33.1	233 57.2	41.2	288 51.8	58.1	208 45.8	11.3	28 09.2	35	21 14.9 + 55
	2	97 11.3	188 39.3	33.3	248 58.1	41.8	303 54.2	58.0	223 48.0	11.4	42 31.7	34	21 20.4 + 54
	3	112 13.8	203 38.3	33.4	263 59.0	42.3	318 56.5	58.0	238 50.1	11.5	56 54.1	33	21 25.8 + 52
	4	127 16.3	218 37.4	33.5	279 00.0	42.9	333 58.8	57.9	253 52.3	11.5	71 16.4	33	21 31.0 + 51
	5	142 18.7	233 36.4	33.6	294 00.9	43.5	349 01.1	57.9	268 54.5	11.6	85 38.7	32	21 36.1 + 49
	6	157 21.2	248 35.5	-24 33.7	309 01.8	-10 44.1	4 03.4	+11 57.8	283 56.6	-17 11.7	100 00.9	32	+21 41.0 + 48
	7	172 23.6	263 34.5	33.8	324 02.8	44.7	19 05.7	57.8	298 58.8	11.7	114 23.1	30	21 45.8 + 46
	8	187 26.1	278 33.6	34.0	339 03.7	45.2	34 08.1	57.8	314 01.0	11.8	128 45.1	30	21 50.4 + 44
	9	202 28.6	293 32.6	34.1	354 04.6	45.8	49 10.4	57.7	329 03.1	11.9	143 07.1	30	21 54.8 + 43
	10	217 31.0	308 31.6	34.2	9 05.5	46.4	64 12.7	57.7	344 05.3	11.9	157 29.1	29	21 59.1 + 41
	11	232 33.5	323 30.7	34.3	24 06.5	47.0	79 15.0	57.6	359 07.5	12.0	171 51.0	28	22 03.2 + 39
	12	247 36.0	338 29.7	-24 34.4	39 07.4	-10 47.6	94 17.3	+11 57.6	14 09.6	-17 12.1	186 12.8	28	+22 07.1 + 38
	13	262 38.4	353 28.8	34.5	54 08.3	48.1	109 19.7	57.5	29 11.8	12.2	200 34.6	27	22 10.9 + 36
	14	277 40.9	8 27.8	34.6	69 09.2	48.7	124 22.0	57.5	44 13.9	12.2	214 56.3	27	22 14.5 + 34
	15	292 43.4	23 26.9	34.7	84 10.2	49.3	139 24.3	57.5	59 16.1	12.3	229 18.0	26	22 17.9 + 33
	16	307 45.8	38 25.9	34.8	99 11.1	49.9	154 26.6	57.4	74 18.3	12.4	243 39.6	25	22 21.2 + 31
	17	322 48.3	53 24.9	34.9	114 12.0	50.5	169 28.9	57.4	89 20.4	12.4	258 01.1	26	22 24.3 + 29
	18	337 50.7	68 24.0	-24 35.0	129 12.9	-10 51.0	184 31.3	+11 57.3	104 22.6	-17 12.5	272 22.7	25	+22 27.2 + 28
	19	352 53.2	83 23.0	35.1	144 13.8	51.6	199 33.6	57.3	119 24.8	12.6	286 44.2	24	22 30.0 + 26
	20	7 55.7	98 22.1	35.2	159 14.8	52.2	214 35.9	57.2	134 26.9	12.6	301 05.6	24	22 32.6 + 24
	21	22 58.1	113 21.1	35.3	174 15.7	52.8	229 38.2	57.2	149 29.1	12.7	315 27.0	24	22 35.0 + 22
	22	38 00.6	128 20.2	35.4	189 16.6	53.4	244 40.5	57.2	164 31.3	12.8	329 48.4	24	22 37.2 + 21
	23	53 03.1	143 19.2	35.5	204 17.5	53.9	259 42.9	57.1	179 33.4	12.9	344 09.8	23	22 39.3 + 19
24	0	68 05.5	158 18.2	-24 35.6	219 18.5	-10 54.5	274 45.2	+11 57.1	194 35.6	-17 12.9	358 31.1	23	+22 41.2 + 17
code	-	- 10	- 1	+ 10	- 6	+ 24	8	+ 21	- 1				

G M T	SUN			STARS			Lat.	Sunrise	Twilt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS											
	GHA	Dec.	No.	Name	SHA	Dec.				27	28	29	30	Alt.	Sun's Low r Limb	Venus	Mars								
h	°	'	°	°	'	°	N	h m	h m	h m	h m	h m	h m	Alt.	Add	Add	Add								
27	0	183	10.3	-20	56.7	7	Acamar	315	50.6	-40	28.8	72	6 13	11 30	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars				
1	198	10.1	57.2			5	Achernar	335	58.3	-57	27.7	70	6 08	12 09	11 22	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars			
2	213	09.9	57.6			30	Acrux	173	58.0	-62	51.1	68	10 15	6 03	12 37	12 27	11 53	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars	
3	228	09.7	58.1			19	Adhara	255	46.1	-28	54.6	66	9 34	5 59	12 58	13 02	13 17	14 04	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
4	243	09.5	58.6			10	Aldebaran	291	38.6	+16	25.4	64	9 06	5 55	13 15	13 28	13 55	14 49	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
5	258	09.4	59.0									62	8 44	5 52	13 29	13 48	14 22	15 19	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
6	273	09.2	-20	59.5		32	Alioth	166	58.8	+56	11.6	60	8 27	5 48	13 41	14 05	14 44	15 42	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
7	288	09.0	21	00.0		34	Alkaid	153	33.2	+49	31.8	58	8 13	5 45	13 51	14 19	15 01	16 00	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
8	303	08.8	00.5			55	Al Na'ir	28	37.8	-47	10.6	56	8 01	5 43	14 00	14 31	15 15	16 16	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
9	318	08.6	00.9			15	Alnilam	276	29.8	-1	13.7	54	7 50	5 40	14 08	14 42	15 28	16 29	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
10	333	08.4	01.4			25	Alphard	218	38.4	-8	28.0	52	7 40	5 37	14 16	14 51	15 39	16 41	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
11	348	08.2	01.9									50	7 32	5 34	14 22	15 00	15 49	16 51	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
12	3	08.0	-21	02.3		41	Alphecca	126	47.9	+26	51.7	45	7 14	5 28	14 36	15 18	16 10	17 12	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
13	18	07.8	02.8			1	Alpheratz	358	28.0	+28	51.1	40	6 59	5 22	14 48	15 33	16 27	17 30	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
14	33	07.6	03.2			51	Altair	62	50.5	+8	45.2	35	6 46	5 16	14 58	15 46	16 41	17 45	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
15	48	07.4	03.7			2	Ankaa	353	57.9	-42	32.8	30	6 35	5 10	15 07	15 57	16 54	17 57	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
16	63	07.2	04.2			42	Antares	113	19.6	-26	20.1	20	6 16	4 59	15 22	16 16	17 15	18 19	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
17	78	07.0	04.6									10	6 00	4 45	15 36	16 32	17 33	18 38	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
18	93	06.8	-21	05.1		37	Arcturus	146	35.4	+19	24.6	0	5 44	4 30	15 49	16 48	17 51	18 56	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
19	108	06.5	05.6			43	Atria	109	00.8	-68	57.0	10	5 28	4 12	16 01	17 04	18 08	19 13	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
20	123	06.3	06.0			22	Avior	234	35.4	-59	21.8	20	5 11	3 49	16 15	17 20	18 27	19 32	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
21	138	06.1	06.5			13	Bellatrix	279	18.0	+6	18.7	30	4 52	3 19	16 31	17 40	18 49	19 54	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
22	153	05.9	06.9			16	Betelge'se	271	47.7	+7	24.0	35	4 40	2 58	16 40	17 51	19 02	20 07	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
23	168	05.7	07.4									40	4 27	2 31	16 51	18 05	19 16	20 22	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
						17	Canopus	264	14.8	-52	40.1	45	4 11	1 53	17 03	18 20	19 34	20 39	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
						12	Capella	281	37.8	+45	57.3	50	3 51	0 38	17 19	18 39	19 55	21 01	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
						53	Deneb	50	01.1	+45	07.7	52	3 42	///	17 26	18 49	20 06	21 12	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
						28	Denebola	183	17.7	+14	49.0	54	3 32	///	17 34	18 59	20 17	21 23	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
						4	Diphda	349	38.9	-18	13.6	56	3 20	///	17 43	19 10	20 31	21 37	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
												58	3 06	///	17 53	19 24	20 46	21 52	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
												60	2 49	///	18 05	19 40	21 05	22 10	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
							Lat.	Sunset	Twilt. ends	Moonset															
h	°	'	°	°	'	°	N	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	Alt.	27	28	29	30			
27	0	183	05.5	-21	07.8	31	Gacrux	172	49.4	-56	51.8	72	17 18	7 18	□	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars			
1	198	05.3	08.3			29	Gienah	176	36.9	-17	17.8	70	17 25	6 40	9 28	□	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars		
2	213	05.1	08.2			35	Hadar	149	49.8	-60	09.5	68	13 20	17 30	6 14	8 25	11 09	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars	
3	228	04.9	09.2			6	Hamal	328	49.2	+23	15.5	66	14 01	17 34	5 54	7 50	9 45	11 14	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
4	243	04.7	09.7			48	Kaus Aust.	84	41.4	-34	24.4	64	14 29	17 38	5 38	7 25	9 07	10 28	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
5	258	04.5	10.1									62	14 51	17 42	5 25	7 05	8 41	9 59	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
6	273	04.3	-21	10.6		40	Kochab	137	19.1	+74	20.0	60	15 08	17 45	5 14	6 49	8 20	9 36	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
7	288	04.1	11.0			57	Markab	14	21.3	+14	58.3	58	15 22	17 48	5 04	6 36	8 03	9 17	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
8	303	03.9	11.5			8	Menkar	314	59.9	+3	55.2	56	15 35	17 52	4 56	6 24	7 49	9 02	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
9	318	03.7	11.9			36	Menkent	148	58.9	-36	09.1	54	15 46	17 55	4 49	6 14	7 36	8 49	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
10	333	03.5	12.4			24	Miapl'dus	221	48.7	-69	31.9	52	15 55	17 57	4 42	6 05	7 25	8 37	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
11	348	03.3	12.8									50	16 04	18 00	4 36	5 57	7 15	8 27	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
12	3	03.1	-21	13.3		9	Mirfak	309	41.7	+49	42.5	45	16 22	18 06	4 23	5 40	6 55	8 05	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
13	18	02.9	13.7			50	Nunki	76	52.0	-26	21.2	40	16 37	18 13	4 13	5 26	6 39	7 48	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
14	33	02.6	14.2			52	Peacock	54	27.4	-56	52.8	35	16 49	18 18	4 04	5 14	6 25	7 33	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
15	48	02.4	14.6			21	Pollux	244	20.2	+28	07.9	30	17 00	18 24	3 56	5 04	6 13	7 20	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
16	63	02.2	15.1			20	Procyon	245	44.6	+5	20.3	20	17 19	18 37	3 42	4 46	5 52	6 58	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
17	78	02.0	15.5			46	R'alhague	96	46.8	+12	35.5	10	17 36	18 50	3 30	4 31	5 34	6 39	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
18	93	01.8	-21	16.0		26	Regulus	208	29.3	+12	10.9	0	17 51	19 05	3 19	4 16	5 17	6 22	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
19	108	01.6	16.4			11	Rigel	281	53.2	-8	15.0	10	18 07	19 23	3 08	4 02	5 01	6 04	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
20	123	01.4	16.8			38	Rigil Kent	140	51.4	-60	39.2	20	18 24	19 46	2 57	3 47	4 43	5 45	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
21	138	01.2	17.3			44	Sabik	103	02.4	-15	40.3	30	18 44	20 18	2 43	3 29	4 22	5 23	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
22	153	01.0	17.7									35	18 56	20 39	2 35	3 19	4 10	5 10	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
23	168	00.8	18.2			3	Schedar	350	29.5	+56	18.1	40	19 09	21 06	2 27	3 07	3 56	4 55	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
						45	Shaula	97	20.9	-37	04.4	45	19 25	21 45	2 17	2 54	3 40	4 37	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
						18	Sirius	259	11.4	-16	39.2	52	19 54	///	1 59	2 30	3 11	4 05	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
						33	Spica	159	17.0	-10	55.9	54	20 05	///	1 52	2 21	3 00	3 53	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
						23	Suhail	223	24.1	-43	15.1	56	20 17	///	1 45	2 12	2 48	3 40	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
						49	Vega	81	08.5	+38	44.7	58	20 31	///	1 38	2 01	2 34	3 24	□	□	□	Alt.	Sun's Low r Limb	Venus	Mars
						39	Zub'g'																		

S M T	VENUS - 3.3				MARS 1.9				JUPITER - 1.7				SATURN 0.7				MOON			
	GHA	GHA	Dec		GHA	Dec			GHA	Dec			GHA	Dec			GHA	code	Dec.	code
30	0	68 05.5	158 18.2	-24 35.6	219 18.5	-10 54.5			274 45.2	+11 57.1			194 35.6	-17 12.9			358 31.1	23	+22 41.2	+ 17
	1	83 08.0	173 17.3	35.7	234 19.4	55.1			289 47.5	57.0			209 37.8	13.0			12 52.4	22	22 42.9	+ 15
	2	98 10.5	188 16.3	35.7	249 20.3	55.7			304 49.8	57.0			224 39.9	13.1			27 13.6	23	22 44.4	+ 14
	3	113 12.9	203 15.4	35.8	264 21.2	56.3			319 52.2	57.0			239 42.1	13.1			41 34.9	22	22 45.8	+ 12
	4	128 15.4	218 14.4	35.9	279 22.2	56.8			334 54.5	56.9			254 44.3	13.2			55 56.1	22	22 47.0	+ 10
	5	143 17.9	233 13.4	36.0	294 23.1	57.4			349 56.8	56.9			269 46.4	13.3			70 17.3	22	22 48.0	+ 8
	6	158 20.3	248 12.5	-24 36.1	309 24.0	-10 58.0			4 59.1	+11 56.8			284 48.6	-17 13.3			84 38.5	22	+22 48.8	+ 7
	7	173 22.8	263 11.5	36.2	324 24.9	58.6			20 01.5	56.8			299 50.8	13.4			98 59.7	22	22 49.5	+ 5
	8	188 25.2	278 10.6	36.3	339 25.9	59.1			35 03.8	56.7			314 52.9	13.5			113 20.9	22	22 50.0	+ 3
	9	203 27.7	293 09.6	36.3	354 26.8	-10 59.7			50 06.1	56.7			329 55.1	13.6			127 42.1	21	22 50.3	+ 1
	10	218 30.2	308 08.6	36.4	9 27.7	11 00.3			65 08.4	56.7			344 57.2	13.6			142 03.2	22	22 50.4	- 1
	11	233 32.6	323 07.7	36.5	24 28.6	00.9			80 10.8	56.6			359 59.4	13.7			156 24.4	22	22 50.3	- 2
	12	248 35.1	338 06.7	-24 36.6	39 29.5	-11 01.5			95 13.1	+11 56.6			15 01.6	-17 13.8			170 45.6	22	+22 50.1	- 4
	13	263 37.6	353 05.8	36.6	54 30.5	02.0			110 15.4	56.5			30 03.7	13.8			185 06.8	21	22 49.7	- 6
	14	278 40.0	8 04.8	36.7	69 31.4	02.6			125 17.7	56.5			45 05.9	13.9			199 27.9	22	22 49.1	- 7
	15	293 42.5	23 03.9	36.8	84 32.3	03.2			140 20.1	56.5			60 08.1	14.0			213 49.1	23	22 48.4	- 10
	16	308 45.0	38 02.9	36.9	99 33.0	03.8			155 22.4	56.4			75 10.2	14.0			228 10.4	22	22 47.4	- 11
	17	323 47.4	53 01.9	36.9	114 34.2	04.3			170 24.7	56.4			90 12.4	14.1			242 31.6	22	22 46.3	- 13
	18	338 49.9	68 01.0	-24 37.0	129 35.1	-11 04.9			185 27.1	+11 56.3			105 14.6	-17 14.2			256 52.8	23	+22 45.0	- 15
	19	353 52.4	83 00.0	37.1	144 36.0	05.5			200 29.4	56.3			120 16.7	14.2			271 14.1	23	22 43.5	- 16
	20	8 54.8	97 59.1	37.1	159 36.9	06.1			215 31.7	56.3			135 18.9	14.3			285 35.4	23	22 41.9	- 18
	21	23 57.3	112 58.1	37.2	174 37.8	06.6			230 34.0	56.2			150 21.1	14.4			299 56.7	23	22 40.1	- 20
	22	38 59.7	127 57.1	37.2	189 38.8	07.2			245 36.4	56.2			165 23.2	14.5			314 18.0	24	22 38.1	- 22
	23	54 02.2	142 56.2	37.3	204 39.7	07.8			260 38.7	56.2			180 25.4	14.5			328 39.4	24	22 35.9	- 23
1	0	69 04.7	157 55.2	-24 37.4	219 40.6	-11 08.4			275 41.0	+11 56.1			195 27.6	-17 14.6			343 00.8	24	+22 33.6	- 25
	1	84 07.1	172 54.3	37.4	234 41.5	08.9			290 43.4	56.1			210 29.7	14.7			357 22.2	25	22 31.1	- 27
	2	99 09.6	187 53.3	37.5	249 42.4	09.5			305 45.7	56.0			225 31.9	14.7			11 43.7	25	22 28.4	- 29
	3	114 12.1	202 52.3	37.5	264 43.4	10.1			320 48.0	56.0			240 34.1	14.8			26 05.2	26	22 25.5	- 30
	4	129 14.5	217 51.4	37.6	279 44.3	10.7			335 50.3	56.0			255 36.2	14.9			40 26.8	26	22 22.5	- 32
	5	144 17.0	232 50.4	37.6	294 45.2	11.3			350 52.7	55.9			270 38.4	14.9			54 48.4	26	22 19.3	- 34
	6	159 19.5	247 49.5	-24 37.7	309 46.1	-11 11.8			5 55.0	+11 55.9			285 40.6	-17 15.0			69 10.0	27	+22 15.9	- 35
	7	174 21.9	262 48.5	37.7	324 47.0	12.4			20 57.3	55.8			300 42.7	15.1			83 31.7	28	22 12.4	- 37
	8	189 24.4	277 47.5	37.8	339 48.0	13.0			35 59.7	55.8			315 44.9	15.1			97 53.5	28	22 08.7	- 39
	9	204 26.8	292 46.6	37.8	354 48.9	13.6			51 02.0	55.8			330 47.1	15.2			112 15.3	28	22 04.8	- 40
	10	219 29.3	307 45.6	37.9	9 49.8	14.1			66 04.3	55.7			345 49.2	15.3			126 37.1	29	22 00.8	- 42
	11	234 31.8	322 44.7	37.9	24 50.7	14.7			81 06.7	55.7			0 51.4	15.4			140 59.0	30	21 56.6	- 44
	12	249 34.2	337 43.7	-24 38.0	39 51.6	-11 15.3			96 09.0	+11 55.7			15 53.6	-17 15.4			155 21.0	31	+21 52.2	- 45
	13	264 36.7	352 42.7	38.0	54 52.6	15.8			111 11.3	55.6			30 55.7	15.5			169 43.1	31	21 47.7	- 47
	14	279 39.2	7 41.8	38.1	69 53.5	16.4			126 13.7	55.6			45 57.9	15.6			184 05.2	31	21 43.0	- 49
	15	294 41.6	22 40.8	38.1	84 54.4	17.0			141 16.0	55.5			61 00.1	15.6			198 27.3	33	21 38.1	- 50
	16	309 44.1	37 39.9	38.1	99 55.3	17.6			156 18.3	55.5			76 02.2	15.7			212 49.6	33	21 33.1	- 51
	17	324 46.6	52 38.9	38.2	114 56.2	18.1			171 20.7	55.5			91 04.4	15.8			227 11.9	34	21 28.0	- 54
	18	339 49.0	67 37.9	-24 38.2	129 57.2	-11 18.7			186 23.0	+11 55.4			106 06.5	-17 15.8			241 34.3	34	+21 22.6	- 54
	19	354 51.5	82 37.0	38.3	144 58.1	19.3			201 25.4	55.4			121 08.7	15.9			255 56.7	36	21 17.2	- 57
	20	9 54.0	97 36.0	38.3	159 59.0	19.9			216 27.7	55.4			136 10.9	16.0			270 19.3	36	21 11.5	- 58
	21	24 56.4	112 35.1	38.3	174 59.9	20.4			231 30.0	55.3			151 13.0	16.0			284 41.9	36	21 05.7	- 59
	22	39 58.9	127 34.1	38.4	190 00.8	21.0			246 32.4	55.3			166 15.2	16.1			299 04.5	38	20 59.8	- 61
	23	55 01.3	142 33.1	38.4	205 01.7	21.6			261 34.7	55.3			181 17.4	16.2			313 27.3	39	20 53.7	- 62
2	0	70 03.8	157 32.2	-24 38.4	220 02.7	-11 22.2			276 37.0	+11 55.2			196 19.5	-17 16.2			327 50.2	39	+20 47.5	- 64
	1	85 06.3	172 31.2	38.4	235 03.6	22.7			291 39.4	55.2			211 21.7	16.3			342 13.1	40	20 41.1	- 65
	2	100 08.7	187 30.3	38.5	250 04.5	23.3			306 41.7	55.1			226 23.9	16.4			356 36.1	41	20 34.6	- 67
	3	115 11.2	202 29.3	38.5	265 05.4	23.9			321 44.0	55.1			241 26.0	16.5			10 59.2	42	20 27.9	- 68
	4	130 13.7	217 28.3	38.5	280 06.3	24.4			336 46.4	55.1			256 28.2	16.5			25 22.4	43	20 21.1	- 69
	5	145 16.1	232 27.4	38.5	295 07.2	25.0			351 48.7	55.0			271 30.4	16.6			39 45.7	43	20 14.2	- 71
	6	160 18.6	247 26.4	-24 38.6	310 08.2	-11 25.6			6 51.1	+11 55.0			286 32.5	-17 16.7			54 09.0	45	+20 07.1	- 73
	7	175 21.1	262 25.5	38.6	325 09.1	26.2			21 53.4	55.0			301 34.7	16.7			68 32.5	45	19 59.8	- 73
	8	190 23.5	277 24.5	38.6	340 10.0	26.7			36 55.7	54.9			316 36.9	16.8			82 56.0	47	19 52.5	- 75
	9	205 26.0	292 23.5	38.6	355 10.9	27.3			51 58.1	54.9			331 39.0	16.9			97 19.7	47	19 45.0	- 77
	10	220 28.5	307 22.6	38.6	10 11.8	27.9			67 00.4	54.9			346 41.2	16.9			111 43.4	48	19 37.3	- 77
	11	235 30.9	322 21.6	38.6	25 12.7	28.4			82 02.8	54.8			1 43.4	17.0			126 07.2	49	19 29.6	- 79
	12	250 33.4	337 20.7	-24 38.7	40 13.7	-11 29.0			97 05.1	+11 54.8			16 45.5	-17 17.1			140 31.1	51	+19 21.7	- 80
	13	265 35.8	352 19.7	38.7	55 14.6	29.6			112 07.4	54.8			31 47.7	17.1			154 55.2	51	19 13.7	- 82
	14	280 38.3	7 18.7	38.7	70 15.5	30.2			127 09.8	54.7			46 49.9	17.2			169 19.3	52	19 05.5	- 82
	15	295 40.8	22 17.8	38.7	85 16.4	30.7			142 12.1	54.7			61 52.0	17.3			183 43.5	53	18 57.3	- 84
	16	310 43.2	37 16.8	38.7	100 17.3	31.3			157 14.5	54.6			76 54.2	17.3			198 07.8	54	18 48.9	- 86
	17	325 45.7	52 15.9	38.7	115 18.2	31.9			172 16.8</											

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS			
	GHA	Dec.	No.	Name	SHA	Dec.				30	1	2	3				
	h	°			°	'				h	m	h	m				
30	0	182 55.4	-21 29.0	7 Acamar	315 50.6	-40 28.8	72	■	6 21	□	□	□	18 20	Alt.	Sun's	Venus	Mars
	1	197 55.2	29.4	5 Achernar	335 58.3	-57 27.7	70	■	6 15	□	□	16 18	18 52		Low'r		
	2	212 54.9	29.8	30 Acrux	173 58.0	-62 51.1	68	10 32	6 09	□	14 36	17 07	19 15		Add	Add	Add
	3	227 54.7	30.2	19 Adhara	255 46.1	-28 54.6	66	9 44	6 05	14 04	15 41	17 38	19 33	°	'	'	'
	4	242 54.5	30.7	10 Aldebaran	291 38.6	+16 25.4	64	9 14	6 00	14 49	16 16	18 01	19 47	0	0.5	0.1	0.1
	5	257 54.3	31.1				62	8 52	5 56	15 19	16 42	18 19	19 59	30	0.5	0.1	0.1
	6	272 54.1	-21 31.5	32 Alioth	166 58.8	+56 11.6	60	8 34	5 53	15 42	17 02	18 34	20 09	45	0.5	0.1	0.0
	7	287 53.8	31.9	34 Alkaid	153 33.2	+49 31.7	58	8 19	5 50	16 00	17 18	18 47	20 18	60	0.5	0.0	0.0
	8	302 53.6	32.3	55 Al Na'ir	28 37.9	-47 10.6	56	8 06	5 46	16 16	17 32	18 58	20 26	75	0.5	0.0	0.0
	9	317 53.4	32.7	15 Alnilam	276 29.8	-1 13.7	54	7 55	5 43	16 29	17 44	19 08	20 33	90	0.5	0.0	0.0
	10	332 53.2	33.2	25 Alphard	218 38.3	-8 28.0	52	7 45	5 40	16 41	17 55	19 16	20 39	Moon's Lower Limb			
	11	347 53.0	33.6				50	7 36	5 37	16 51	18 04	19 24	20 45	Add			
	12	2 52.7	-21 34.0	41 Alphecca	126 47.9	+26 51.7	45	7 17	5 31	17 12	18 24	19 40	20 57	Alt.	30	1	2
	13	17 52.5	34.4	1 Alpheratz	358 28.0	+28 51.1	40	7 02	5 25	17 30	18 40	19 53	21 06	°	'	'	'
	14	32 52.3	34.8	51 Altair	62 50.5	+8 45.2	35	6 49	5 19	17 45	18 54	20 05	21 15	0	21.0	20.8	20.3
	15	47 52.1	35.2	2 Ankaa	353 58.0	-42 32.8	30	6 38	5 13	17 57	19 05	20 15	21 22	4	21.0	20.7	20.2
	16	62 51.8	35.6	42 Antares	113 19.6	-26 20.1	20	6 18	5 00	18 19	19 26	20 32	21 35	8	21.0	20.6	20.2
	17	77 51.6	36.1				10	6 01	4 47	18 38	19 43	20 46	21 46	12	20.9	20.7	20.1
	18	92 51.4	-21 36.5	37 Arcturus	146 35.3	+19 24.6	0	5 45	4 31	18 56	19 59	21 00	21 56	16	20.8	20.6	20.1
	19	107 51.2	36.9	43 Atria	109 00.7	-68 57.0	10	5 29	4 12	19 13	20 16	21 14	22 07	20	20.7	20.5	20.0
	20	122 50.9	37.3	22 Avior	234 35.3	-59 21.8	20	5 12	3 49	19 32	20 33	21 28	22 17	24	20.6	20.4	19.9
	21	137 50.7	37.7	13 Bellatrix	279 17.9	+6 18.7	30	4 51	3 17	19 54	20 53	21 45	22 30	28	20.4	20.2	19.8
	22	152 50.5	38.1	16 Betelge'se	271 47.7	+7 24.0	35	4 39	2 56	20 07	21 05	21 55	22 37	32	20.3	20.1	19.6
	23	167 50.3	38.5				40	4 26	2 28	20 22	21 18	22 06	22 45	36	20.1	19.9	19.5
1	0	182 50.0	-21 38.9	17 Canopus	264 14.8	-52 40.1	45	4 09	1 49	20 39	21 34	22 19	22 55	40	19.9	19.7	19.3
	1	197 49.8	39.3	12 Capella	281 37.7	+45 57.3	50	3 49	0 20	21 01	21 54	22 34	23 06	44	19.7	19.5	19.1
	2	212 49.6	39.7	53 Deneb	50 01.1	+45 07.7	52	3 39	///	21 12	22 03	22 42	23 11	48	19.5	19.3	18.9
	3	227 49.4	40.1	28 Denebola	183 17.7	+14 49.0	54	3 29	///	21 23	22 13	22 50	23 17	52	19.2	19.1	18.7
	4	242 49.1	40.5	4 Diphda	349 38.9	-18 13.6	56	3 16	///	21 37	22 25	22 59	23 24	56	19.0	18.8	18.5
	5	257 48.9	40.9				58	3 02	///	21 52	22 38	23 09	23 31	60	18.7	18.6	18.3
	6	272 48.7	-21 41.3	27 Dubhe	194 44.5	+61 59.0	60	2 44	///	22 10	22 54	23 21	23 39	64	18.5	18.3	18.1
	7	287 48.5	41.7	14 Elnath	279 06.8	+28 34.3								68	18.2	18.1	17.8
	8	302 48.2	42.1	47 Eltanin	91 06.7	+51 29.8								72	17.9	17.8	17.6
	9	317 48.0	42.5	54 Enif	34 29.5	+9 40.5								76	17.6	17.5	17.3
	10	332 47.8	42.9	56 Fomalhaut	16 11.4	-29 51.4								80	17.3	17.2	17.1
	11	347 47.5	43.3											84	17.0	17.0	16.8
	12	2 47.3	-21 43.7	31 Gacrux	172 49.4	-56 51.8	72	13 05	17 13	11 14	11 52	12 03	12 07	88	16.8	16.7	16.6
	13	17 47.1	44.1	29 Glenah	176 36.9	-17 17.8	70	13 05	17 26	10 28	11 16	11 40	11 52	Add to table, back cover			
	14	32 46.9	44.5	35 Hadar	149 49.7	-60 09.5	68	13 53	17 31	9 59	10 50	11 21	11 39	Moon's Upper Limb			
	15	47 46.6	44.9	6 Hamal	328 49.2	+23 15.5	66	14 23	17 35	9 36	10 30	11 05	11 28	Subtract			
	16	62 46.4	45.3	48 Kaus Aust.	84 41.4	-34 24.4	64	14 46	17 40	9 02	9 59	10 40	11 09	Alt.	30	1	2
	17	77 46.2	45.7				62	15 04	17 43	8 49	9 47	10 30	11 02	°	'	'	'
	18	92 45.9	-21 46.1	40 Kochab	137 19.1	+74 20.0	58	15 19	17 47	8 17	9 13	10 52	11 18	0	12.4	12.6	12.9
	19	107 45.7	46.5	57 Markab	14 21.3	+14 58.3	56	15 32	17 50	8 02	9 59	10 40	11 09	4	12.5	12.6	12.9
	20	122 45.5	46.9	8 Menkar	314 59.9	+3 55.2	54	15 43	17 53	8 49	9 47	10 30	11 02	8	12.5	12.6	12.9
	21	137 45.2	47.3	36 Menkent	148 58.8	-36 09.1	52	15 53	17 56	8 37	9 36	10 21	10 55	12	12.5	12.7	13.0
	22	152 45.0	47.7	24 Miapl'dus	221 48.6	-69 31.9	50	16 02	17 59	8 27	9 26	10 13	10 49	16	12.6	12.8	13.0
	23	167 44.8	48.1				45	16 20	18 05	8 05	9 06	9 55	10 36	20	12.7	12.9	13.1
2	0	182 44.5	-21 48.5	9 Mirfak	309 41.7	+49 42.5	40	16 36	18 12	7 48	8 49	9 41	10 24	24	12.9	13.0	13.2
	1	197 44.3	48.8	50 Nunki	76 52.0	-26 21.2	35	16 49	18 18	7 33	8 35	9 29	10 15	28	13.0	13.1	13.4
	2	212 44.1	49.2	52 Peacock	54 27.4	-56 52.8	30	17 00	18 24	7 20	8 23	9 18	10 07	32	13.2	13.3	13.5
	3	227 43.8	49.6	20 Procyon	245 44.6	+5 20.3	20	17 19	18 37	6 58	8 02	9 00	9 52	36	13.3	13.4	13.6
	4	242 43.6	50.0				10	17 36	18 51	6 39	7 43	8 44	9 39	40	13.5	13.6	13.8
	5	257 43.4	50.4	46 R'alhague	96 46.8	+12 35.5	0	17 53	19 07	6 22	7 26	8 29	9 27	44	13.7	13.8	14.0
	6	272 43.1	-21 50.8	26 Regulus	208 29.3	+12 10.9	10	18 09	19 26	6 04	7 09	8 14	9 15	48	14.0	14.0	14.2
	7	287 42.9	51.2	11 Rigel	281 53.2	-8 15.0	20	18 26	19 49	5 45	6 50	7 57	9 02	52	14.2	14.3	14.4
	8	302 42.7	51.5	38 Rigel Kent.	140 51.4	-60 39.2	30	18 47	20 21	5 23	6 29	7 38	8 47	56	14.4	14.5	14.6
	9	317 42.4	51.9	44 Sabik	103 02.4	-15 40.3	35	18 58	20 42	5 10	6 17	7 27	8 38	60	14.7	14.7	14.8
	10	332 42.2	52.3				40	19 12	21 10	4 55	6 02	7 14	8 28	64	15.0	15.0	15.1
	11	347 42.0	52.7	3 Schedar	350 29.5	+56 18.1	45	19 29	21 51	4 37	5 45	6 59	8 16	68	15.2	15.3	15.3
	12	2 41.7	-21 53.1	45 Shaula	97 20.9	-37 04.4	50	19 49	23 26	4 15	5 23	6 41	8 02	72	15.5	15.5	15.5
	13	17 41.5	53.4	18 Sirius	259 11.4	-16 39.2	52	19 59	///	4 05	5 13	6 32	7 55	76	15.8	15.8	15.8
	14	32 41.3	53.8	33 Spica	159 17.0	-10 55.9	54	20 10	///	3 53	5 02	6 22	7 47	80	16.1	16.1	16.0
	15	47 41.0	54.2	23 Suhail	223 24.0	-43 15.1	56	20 22	///	3 40	4 48	6 11	7 39	84	16.4	16.4	16.3
	16	62 40.8	54.6				58	20 37	///	3 24	4 33	5 58	7 29	88	16.6	16.6	16.5
	17	77 40.5	55.0	49 Vega	81 08.5	+38 44.7	60	20 54	///	3 05	4 15	5 43	7 18	90	Subtract from table, back cover		
	18	92 40.3	-21 55.3	39 Zub'g'bi	137 53.5	-15 51.5											
	19	107 40.1	55.7														
	20	122 39.8	56.1														
	21	137 39.6	56.5														
	22	152 39.4	56.8														
	23	167 39.1	57.2														
24	0	182 38.9	-21 57.6														

G M T	VENUS - 3.3		MARS 1.9		JUPITER - 1.8		SATURN 0.7		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
3 0	71 03.0	157 09.1	-24 38.7	220 24.6	-11 35.9	277 33.2	+11 54.4	197 11.5	-17 17.9	313 25.9	63 +17 37.5	- 94
1	86 05.4	172 08.2	38.7	235 25.6	36.4	292 35.6	54.3	212 13.7	18.0	327 51.2	63 17 28.1	- 96
2	101 07.9	187 07.2	38.7	250 26.5	37.0	307 37.9	54.3	227 15.9	18.0	342 16.5	64 17 18.5	- 96
3	116 10.3	202 06.3	.. 38.7	265 27.4	.. 37.6	322 40.3	.. 54.3	242 18.0	.. 18.1	356 41.9	65 17 08.9	- 97
4	131 12.8	217 05.3	38.7	280 28.3	38.1	337 42.6	54.2	257 20.2	18.2	11 07.4	67 16 59.2	- 99
5	146 15.3	232 04.3	38.7	295 29.2	38.7	352 44.9	54.2	272 22.4	18.2	25 33.1	67 16 49.3	- 99
6	161 17.7	247 03.4	-24 38.7	310 30.1	-11 39.3	7 47.3	+11 54.2	287 24.5	-17 18.3	39 58.8	69 +16 39.4	-100
7	176 20.2	262 02.4	38.6	325 31.0	39.8	22 49.6	54.1	302 26.7	18.4	54 24.7	69 16 29.4	-101
8	191 22.7	277 01.5	38.6	340 32.0	40.4	37 52.0	54.1	317 28.9	18.4	68 50.6	71 16 19.3	-103
9	206 25.1	292 00.5	.. 38.6	355 32.9	.. 41.0	52 54.3	.. 54.1	332 31.0	.. 18.5	83 16.7	71 16 09.0	-103
10	221 27.6	306 59.5	38.6	10 33.8	41.6	67 56.7	54.1	347 33.2	18.6	97 42.8	73 15 58.7	-104
11	236 30.1	321 58.6	38.6	25 34.7	42.1	82 59.0	54.0	2 35.4	18.6	112 09.1	73 15 48.3	-104
12	251 32.5	336 57.6	-24 38.6	40 35.6	-11 42.7	98 01.4	+11 54.0	17 37.5	-17 18.7	126 35.4	75 +15 37.9	-106
13	266 35.0	351 56.7	38.5	55 36.5	43.3	113 03.7	54.0	32 39.7	18.8	141 01.9	76 15 27.3	-107
14	281 37.4	6 55.7	38.5	70 37.4	43.8	128 06.1	53.9	47 41.9	18.8	155 28.5	76 15 16.6	-107
15	296 39.9	21 54.7	.. 38.5	85 38.3	.. 44.4	143 08.4	.. 53.9	62 44.0	.. 18.9	169 55.1	78 15 05.9	-108
16	311 42.4	36 53.8	38.5	100 39.3	45.0	158 10.8	53.9	77 46.2	19.0	184 21.9	79 14 55.1	-109
17	326 44.8	51 52.8	38.5	115 40.2	45.5	173 13.1	53.8	92 48.4	19.0	198 48.8	79 14 44.2	-110
18	341 47.3	66 51.9	-24 38.4	130 41.1	-11 46.1	188 15.5	+11 53.8	107 50.5	-17 19.1	213 15.7	81 +14 33.2	-111
19	356 49.8	81 50.9	38.4	145 42.0	46.7	203 17.8	53.8	122 52.7	19.2	227 42.8	82 14 22.1	-111
20	11 52.2	96 50.0	38.4	160 42.9	47.2	218 20.2	53.7	137 54.9	19.2	242 10.0	83 14 11.0	-112
21	26 54.7	111 49.0	.. 38.3	175 43.8	.. 47.8	233 22.5	.. 53.7	152 57.0	.. 19.3	256 37.3	83 13 59.8	-113
22	41 57.2	126 48.0	38.3	190 44.7	48.4	248 24.9	53.7	167 59.2	19.4	271 04.6	85 13 48.5	-113
23	56 59.6	141 47.1	38.3	205 45.6	48.9	263 27.2	53.6	183 01.4	19.5	285 32.1	86 13 37.2	-114
4 0	72 02.1	156 46.1	-24 38.2	220 46.6	-11 49.5	278 29.6	+11 53.6	198 03.5	-17 19.5	299 59.7	86 +13 25.8	-115
1	87 04.6	171 45.2	38.2	235 47.5	50.1	293 31.9	53.6	213 05.7	19.6	314 27.3	88 13 14.3	-115
2	102 07.0	186 44.2	38.2	250 48.4	50.6	308 34.3	53.6	228 07.9	19.7	328 55.1	89 13 02.8	-116
3	117 09.5	201 43.2	.. 38.1	265 49.3	.. 51.2	323 36.6	.. 53.5	243 10.0	.. 19.7	343 23.0	89 12 51.2	-117
4	132 11.9	216 42.3	38.1	280 50.2	51.8	338 39.0	53.5	258 12.2	19.8	357 50.9	91 12 39.5	-117
5	147 14.4	231 41.3	38.0	295 51.1	52.3	353 41.3	53.5	273 14.4	19.9	12 19.0	91 12 27.8	-118
6	162 16.9	246 40.4	-24 38.0	310 52.0	-11 52.9	8 43.7	+11 53.4	288 16.6	-17 19.9	26 47.1	93 +12 16.0	-118
7	177 19.3	261 39.4	38.0	325 52.9	53.5	23 46.0	53.4	303 18.7	20.0	41 15.4	93 12 04.2	-119
8	192 21.8	276 38.4	37.9	340 53.8	54.0	38 48.4	53.4	318 20.9	20.1	55 43.7	94 11 52.3	-119
9	207 24.3	291 37.5	.. 37.9	355 54.8	.. 54.6	53 50.8	.. 53.3	333 23.1	.. 20.1	70 12.1	95 11 40.4	-120
10	222 26.7	306 36.5	37.8	10 55.7	55.2	68 53.1	53.3	348 25.2	20.2	84 40.6	97 11 28.4	-121
11	237 29.2	321 35.6	37.8	25 56.6	55.7	83 55.5	53.3	3 27.4	20.3	99 09.3	97 11 16.3	-121
12	252 31.7	336 34.6	-24 37.7	40 57.5	-11 56.3	98 57.8	+11 53.3	18 29.6	-17 20.3	113 38.0	97 +11 04.2	-121
13	267 34.1	351 33.7	37.7	55 58.4	56.8	114 00.2	53.2	33 31.7	20.4	128 06.7	99 10 52.1	-122
14	282 36.6	6 32.7	37.6	70 59.3	57.4	129 02.5	53.2	48 33.9	20.5	142 35.6	100 10 39.9	-122
15	297 39.1	21 31.7	.. 37.6	86 00.2	.. 58.0	144 04.9	.. 53.2	63 36.1	.. 20.5	157 04.6	100 10 27.7	-123
16	312 41.5	36 30.8	37.5	101 01.1	58.5	159 07.2	53.1	78 38.2	20.6	171 33.6	102 10 15.4	-123
17	327 44.0	51 29.8	37.5	116 02.0	59.1	174 09.6	53.1	93 40.4	20.7	186 02.8	102 10 03.1	-123
18	342 46.4	66 28.9	-24 37.4	131 02.9	-11 59.7	189 12.0	+11 53.1	108 42.6	-17 20.7	200 32.0	103 + 9 50.8	-124
19	357 48.9	81 27.9	37.3	146 03.8	12 00.2	204 14.3	53.1	123 44.7	20.8	215 01.3	104 9 38.4	-125
20	12 51.4	96 26.9	37.3	161 04.8	00.8	219 16.7	53.0	138 46.9	20.9	229 30.7	104 9 25.9	-124
21	27 53.8	111 26.0	.. 37.2	176 05.7	.. 01.4	234 19.0	.. 53.0	153 49.1	.. 20.9	244 00.1	106 9 13.5	-125
22	42 56.3	126 25.0	37.2	191 06.6	01.9	249 21.4	53.0	168 51.2	21.0	258 29.7	106 9 01.0	-126
23	57 58.8	141 24.1	37.1	206 07.5	02.5	264 23.7	52.9	183 53.4	21.1	272 59.3	107 8 48.4	-125
5 0	73 01.2	156 23.1	-24 37.0	221 08.4	-12 03.0	279 26.1	+11 52.9	198 55.6	-17 21.1	287 29.0	108 + 8 35.9	-126
1	88 03.7	171 22.2	37.0	236 09.3	03.6	294 28.5	52.9	213 57.7	21.2	301 58.8	109 8 23.3	-126
2	103 06.2	186 21.2	36.9	251 10.2	04.2	309 30.8	52.9	228 59.9	21.3	316 28.7	109 8 10.7	-127
3	118 08.6	201 20.2	.. 36.8	266 11.1	.. 04.7	324 33.2	.. 52.8	244 02.1	.. 21.3	330 58.6	110 7 58.0	-126
4	133 11.1	216 19.3	36.7	281 12.0	05.3	339 35.5	52.8	259 04.2	21.4	345 28.6	111 7 45.4	-127
5	148 13.6	231 18.3	36.7	296 12.9	05.9	354 37.9	52.8	274 06.4	21.5	359 58.7	112 7 32.7	-127
6	163 16.0	246 17.4	-24 36.6	311 13.8	-12 06.4	9 40.3	+11 52.7	289 08.6	-17 21.5	14 28.9	112 + 7 19.9	-128
7	178 18.5	261 16.4	36.5	326 14.7	07.0	24 42.6	52.7	304 10.7	21.6	28 59.1	113 7 07.2	-128
8	193 20.9	276 15.5	36.4	341 15.7	07.6	39 45.0	52.7	319 12.9	21.7	43 29.4	114 6 54.4	-128
9	208 23.4	291 14.5	.. 36.4	356 16.6	.. 08.1	54 47.4	.. 52.7	334 15.1	.. 21.7	57 59.8	114 6 41.6	-128
10	223 25.9	306 13.5	36.3	11 17.5	08.7	69 49.7	52.6	349 17.3	21.8	72 30.2	116 6 28.8	-128
11	238 28.3	321 12.6	36.2	26 18.4	09.2	84 52.1	52.6	4 19.4	21.9	87 00.8	115 6 16.0	-128
12	253 30.8	336 11.6	-24 36.1	41 19.3	-12 09.8	99 54.4	+11 52.6	19 21.6	-17 21.9	101 31.3	117 + 6 03.2	-129
13	268 33.3	351 10.7	36.0	56 20.2	10.4	114 56.8	52.6	34 23.8	22.0	116 02.0	117 5 50.3	-128
14	283 35.7	6 09.7	36.0	71 21.1	10.9	129 59.2	52.5	49 25.9	22.1	130 32.7	118 5 37.5	-129
15	298 38.2	21 08.8	.. 35.9	86 22.0	.. 11.5	145 01.5	.. 52.5	64 28.1	.. 22.1	145 03.5	118 5 24.6	-129
16	313 40.7	36 07.8	35.8	101 22.9	12.0	160 03.9	52.5	79 30.3	22.2	159 34.3	119 5 11.7	-129
17	328 43.1	51 06.8	35.7	116 23.8	12.6	175 06.3	52.5	94 32.4	22.3	174 05.2	119 4 58.8	-129
18	343 45.6	66 05.9	-24 35.6	131 24.7	-12 13.2	190 08.6	+11 52.4	109 34.6	-17 22.3	188 36.1	121 + 4 45.9	-129
19	358 48.0	81 04.9	35.5	146 25.6	13.7	205 11.0	52.4	124 36.8	22.4	203 07.2	120 4 33.0	-129
20	13 50.5	96 04.0	35.4	161 26.5	14.3	220 13.4	52.4	139 38.9	22.5	217 38.2	122 4 20.1	-129
21	28 53.0	111 03.0	.. 35.3	176 27.4	.. 14.8	235 15.7	.. 52.4	154 41.1	.. 22.5	232 09.4	122 4 07.2	-130
22	43 55.4	126 02.1	35.2	191 28.3	15.4	250 18.1	52.3	169 43.3	22.6	246 40.6	122 3 54.2	-129
23	58 57.9	141 01.1	35.1	206 29.2	16.0	265 20.5	52.3	184 45.4	22.7	261 11.8	123 3 41.3	-129
24	74 00.4	156 00.2	-24 35.1	221 30.2	-12 16.5	280 22.8	+11 52.3	199 47.6	-17 22.7	275 43.1	123 + 3 28.4	-130
3000	-	- 9	0	+ 9	- 5	+ 24	- 1	+ 21	- 1			

G M T	SUN		STARS		Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS																				
	GHA	Dec.	No.	Name				SHA	Dec.					Sun's Low'r Limb Add	Venus Add	Mars Add																
										3	4	5	6																			
h	o	'	o	'	o	'	h	m	h	m	h	m	h	m	Alt.																	
30	182	38.9	-21	57.6	7	Acamar	315	50.6	-40	28.8	72	6 28	18 20	20 45	22 50	24 48																
1	197	38.6		57.9	5	Achernar	335	58.3	-57	27.7	70	6 21	18 52	21 00	22 56	24 45																
2	212	38.4		58.3	30	Acrux	173	57.9	-62	51.1	68	10 51	6 16	19 15	21 12	23 00	24 43															
3	227	38.2	..	58.7	19	Adhara	255	46.1	-28	54.6	66	9 55	6 10	19 33	21 21	23 03	24 41															
4	242	37.9		59.1	10	Aldebaran	291	38.5	+16	25.4	64	9 22	6 06	19 47	21 30	23 06	24 39															
5	257	37.7		59.4							62	8 58	6 01	19 59	21 36	23 09	24 38															
6	272	37.4	-21	59.8	32	Alioth	166	58.7	+56	11.6	60	8 40	5 58	20 09	21 42	23 11	24 37															
7	287	37.2	22	00.2	34	Alkaid	153	33.1	+49	31.7	58	8 24	5 54	20 18	21 48	23 13	24 36															
8	302	36.9		00.5	55	Al Na'ir	28	37.9	-47	10.6	56	8 11	5 50	20 26	21 52	23 15	24 35															
9	317	36.7	..	00.9	15	Alnilam	276	29.8	-1	13.7	54	7 59	5 47	20 33	21 56	23 17	24 34															
10	332	36.5		01.3	25	Alphard	218	38.3	-8	28.0	52	7 49	5 44	20 39	22 00	23 18	24 33															
11	347	36.2		01.6							50	7 40	5 41	20 45	22 04	23 19	24 33															
12	2 36.0	-22	02.0		41	Alphecca	126	47.9	+26	51.7	45	7 20	5 34	20 57	22 11	23 22	24 31															
13	17	35.7		02.3	1	Alpheratz	358	28.0	+28	51.1	40	7 05	5 28	21 06	22 17	23 25	24 30															
14	32	35.5		02.7	51	Altair	62	50.5	+8	45.2	35	6 52	5 21	21 15	22 22	23 27	24 29															
15	47	35.2	..	03.1	2	Ankaa	353	58.0	-42	32.8	30	6 40	5 14	21 22	22 27	23 28	24 28															
16	62	35.0		03.4	42	Antares	113	19.6	-26	20.1	20	6 20	5 01	21 35	22 35	23 32	24 26															
17	77	34.8		03.8							10	6 03	4 47	21 46	22 42	23 34	24 25															
18	92	34.5	-22	04.1	37	Arcturus	146	35.3	+19	24.6	0	5 46	4 32	21 56	22 48	23 37	24 23															
19	107	34.3		04.5	43	Atria	109	00.7	-68	57.0	10	5 30	4 12	22 07	22 55	23 40	24 22															
20	122	34.0		04.9	22	Avior	234	35.3	-59	21.9	20	5 12	3 49	22 17	23 02	23 42	24 21															
21	137	33.8	..	05.2	13	Bellatrix	279	17.9	+6	18.7	30	4 51	3 16	22 30	23 09	23 45	24 19															
22	152	33.5		05.6	16	Betelge'se	271	47.6	+7	24.0	35	4 39	2 55	22 37	23 14	23 47	24 19															
23	167	33.3		05.9							40	4 25	2 26	22 45	23 19	23 49	24 18															
					17	Canopus	264	14.8	-52	40.2	45	4 08	1 45	22 55	23 25	23 52	24 16															
					12	Capella	281	37.7	+45	57.3	50	3 47	///	23 06	23 32	23 55	24 15															
					53	Deneb	50	01.2	+45	07.7	52	3 37	///	23 11	23 35	23 56	24 15															
					28	Denebola	183	17.7	+14	49.0	54	3 26	///	23 17	23 39	23 57	24 14															
					4	Diphda	349	38.9	-18	13.6	56	3 13	///	23 24	23 43	23 59	24 13															
											58	2 58	///	23 31	23 47	24 01	0 01															
					27	Dubhe	194	44.5	+61	59.0	60	2 40	///	23 39	23 52	24 02	0 02															
					14	Elnath	279	06.8	+28	34.3	S																					
					47	Eltanin	91	06.7	+51	29.7																						
					54	Enif	34	29.6	+9	40.5	Lat.	Sunset	Twlt. ends	Moonset																		
					56	Fomalhaut	16	11.5	-29	51.4	N	o	h	m	h	m	h	m	h	m												
					31	Gacrux	172	49.3	-56	51.8	72	///	17 09	13 24	12 50	12 28	12 09															
					29	Gienah	176	36.8	-17	17.8	70	///	17 16	12 51	12 33	12 20	12 08															
					35	Hadar	149	49.7	-60	09.5	68	12 49	17 23	12 27	12 19	12 13	12 07															
					6	Hamal	328	49.2	+23	15.5	66	13 45	17 28	12 07	12 08	12 08	12 07															
					48	Kaus Aust.	84	41.4	-34	24.4	64	14 17	17 32	11 52	11 59	12 03	12 06															
											62	14 41	17 37	11 37	11 51	11 59	12 05															
					40	Kochab	137	19.1	+74	19.9	60	15 00	17 41	11 28	11 43	11 55	12 05															
					57	Markab	14	21.3	+14	58.3	58	15 16	17 45	11 18	11 37	11 52	12 05															
					8	Menkar	314	59.9	+3	55.2	56	15 29	17 48	11 09	11 31	11 49	12 04															
					36	Menkent	148	58.8	-36	09.1	54	15 41	17 52	11 02	11 26	11 46	12 04															
					24	Miapl'dus	221	48.6	-69	31.9	52	15 51	17 55	10 55	11 22	11 44	12 04															
					9	Mirfak	309	41.7	+49	42.5	50	16 00	17 58	10 49	11 18	11 42	12 03															
					50	Nunki	76	52.0	-26	21.2	45	16 19	18 04	10 36	11 09	11 37	12 03															
					52	Peacock	54	27.4	-56	52.8	40	16 35	18 12	10 24	11 01	11 33	12 02															
					21	Pollux	244	20.1	+28	07.9	35	16 48	18 18	10 15	10 55	11 30	12 02															
					20	Procyon	245	44.6	+5	20.3	30	17 00	18 25	10 07	10 49	11 27	12 01															
											20	17 20	18 38	9 52	10 39	11 21	12 01															
											10	17 37	18 52	9 39	10 30	11 16	12 00															
					46	R'alhague	96	46.8	+12	35.5	0	17 54	19 08	9 27	10 21	11 12	11 59															
					26	Regulus	208	29.3	+12	10.9	10	18 10	19 27	9 15	10 13	11 07	11 59															
					11	Rigel	281	53.2	-8	15.0	20	18 28	19 51	9 02	10 04	11 02	11 58															
					38	Rigel Kent.	140	51.3	-60	39.2	30	18 49	20 24	8 47	9 53	10 57	11 57															
					44	Sabik	103	02.4	-15	40.3	35	19 01	20 46	8 38	9 47	10 53	11 57															
											40	19 15	21 14	8 28	9 40	10 50	11 56															
					3	Schedar	350	29.5	+56	18.1	45	19 32	21 57	8 16	9 32	10 45	11 55															
					45	Shaula	97	20.9	-37	04.4	50	19 53	///	8 02	9 22	10 40	11 54															
					18	Sirius	259	11.4	-16	39.2	52	20 03	///	7 55	9 18	10 38	11 54															
					33	Spica	159	16.9	-10	55.9	54	20 14	///	7 47	9 13	10 35	11 54															
					23	Suhail	223	24.0	-43	15.1	56	20 27	///	7 39	9 07	10 32	11 53															
											58	20 42	///	7 29	9 01	10 29	11 53															
					49	Vega	81	08.6	+38	44.7	60	21 00	///	7 18	8 54	10 25	11 52															
					39	Zub'g'bi	137	53.5	-15	51.5	S																					
G M T	Equation of Time (App.—Mean)				GMT of Transit																											
					Meridian of Greenwich																											
									DAY				Moon				Venus				Mars				Jupiter				Saturn			
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G M T	T GHA	VENUS - 3.3		MARS 1.9		JUPITER - 1.8		SATURN 0.7		MOON			
		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
6 0	74 00.4	156 00.2	-24 35.1	221 30.2	-12 16.5	280 22.8	+11 52.3	199 47.6	-17 22.7	275 43.1	123 +	3 28.4	-130
1	89 02.8	170 59.2	35.0	236 31.1	17.1	295 25.2	52.3	214 49.8	22.8	290 14.4	124	3 15.4	-129
2	104 05.3	185 58.2	34.9	251 32.0	17.6	310 27.6	52.2	229 52.0	22.9	304 45.8	125	3 02.5	-129
3	119 07.8	200 57.3	34.8	266 32.9	18.2	325 29.9	52.2	244 54.1	22.9	319 17.3	125	2 49.6	-130
4	134 10.2	215 56.3	34.6	281 33.8	18.8	340 32.3	52.2	259 56.3	23.0	333 48.8	125	2 36.6	-129
5	149 12.7	230 55.4	34.5	296 34.7	19.3	355 34.7	52.2	274 58.5	23.1	348 20.3	126	2 23.7	-129
6	164 15.2	245 54.4	-24 34.4	311 35.6	-12 19.9	10 37.0	+11 52.1	290 00.6	-17 23.1	2 51.9	127 +	2 10.8	-129
7	179 17.6	260 53.5	34.3	326 36.5	20.4	25 39.4	52.1	305 02.8	23.2	17 23.6	127	1 57.9	-129
8	194 20.1	275 52.5	34.2	341 37.4	21.0	40 41.8	52.1	320 05.0	23.3	31 55.3	127	1 45.0	-130
9	209 22.5	290 51.6	34.1	356 38.3	21.6	55 44.1	52.1	335 07.1	23.3	46 27.0	128	1 32.0	-128
10	224 25.0	305 50.6	34.0	11 39.2	22.1	70 46.5	52.0	350 09.3	23.4	60 58.8	128	1 19.2	-129
11	239 27.5	320 49.7	33.9	26 40.1	22.7	85 48.9	52.0	5 11.5	23.5	75 30.6	128	1 06.3	-129
12	254 29.9	335 48.7	-24 33.8	41 41.0	-12 23.2	100 51.2	+11 52.0	20 13.6	-17 23.5	90 02.4	129 +	0 53.4	-129
13	269 32.4	350 47.8	33.7	56 41.9	23.8	115 53.6	52.0	35 15.8	23.6	104 34.3	130	0 40.5	-128
14	284 34.9	5 46.8	33.6	71 42.8	24.3	130 56.0	51.9	50 18.0	23.7	119 06.3	130	0 27.7	-129
15	299 37.3	20 45.8	33.4	86 43.7	24.9	145 58.4	51.9	65 20.2	23.7	133 38.3	130	0 14.8	-128
16	314 39.8	35 44.9	33.3	101 44.6	25.5	161 00.7	51.9	80 22.3	23.8	148 10.3	130 +	0 02.0	-128
17	329 42.3	50 43.9	33.2	116 45.5	26.0	176 03.1	51.9	95 24.5	23.9	162 42.3	131 -	0 10.8	-128
18	344 44.7	65 43.0	-24 33.1	131 46.4	-12 26.6	191 05.5	+11 51.8	110 26.7	-17 23.9	177 14.4	131 -	0 23.6	-128
19	359 47.2	80 42.0	33.0	146 47.3	27.1	206 07.8	51.8	125 28.8	24.0	191 46.5	132	0 36.4	-128
20	14 49.7	95 41.1	32.8	161 48.2	27.7	221 10.2	51.8	140 31.0	24.1	206 18.7	131	0 49.2	-127
21	29 52.1	110 40.1	32.7	176 49.1	28.2	236 12.6	51.8	155 33.2	24.1	220 50.8	132	1 01.9	-127
22	44 54.6	125 39.2	32.6	191 50.0	28.8	251 15.0	51.8	170 35.3	24.2	235 23.0	133	1 14.6	-127
23	59 57.0	140 38.2	32.5	206 50.9	29.4	266 17.3	51.7	185 37.5	24.3	249 55.3	132	1 27.3	-127
7 0	74 59.5	155 37.3	-24 32.3	221 51.8	-12 29.9	281 19.7	+11 51.7	200 39.7	-17 24.3	264 27.5	133 -	1 40.0	-127
1	90 02.0	170 36.3	32.2	236 52.7	30.5	296 22.1	51.7	215 41.8	24.4	278 59.8	134	1 52.7	-126
2	105 04.4	185 35.4	32.1	251 53.6	31.0	311 24.5	51.7	230 44.0	24.5	293 32.2	134	2 05.3	-127
3	120 06.9	200 34.4	31.9	266 54.5	31.6	326 26.8	51.6	245 46.2	24.5	308 04.5	134	2 18.0	-125
4	135 09.4	215 33.5	31.8	281 55.4	32.1	341 29.2	51.6	260 48.4	24.6	322 36.9	134	2 30.5	-126
5	150 11.8	230 32.5	31.7	296 56.3	32.7	356 31.6	51.6	275 50.5	24.7	337 09.3	134	2 43.1	-126
6	165 14.3	245 31.6	-24 31.5	311 57.2	-12 33.2	11 34.0	+11 51.6	290 52.7	-17 24.7	351 41.7	134 -	2 55.7	-125
7	180 16.8	260 30.6	31.4	326 58.1	33.8	26 36.3	51.6	305 54.9	24.8	6 14.1	135	3 08.2	-125
8	195 19.2	275 29.7	31.2	341 59.0	34.4	41 38.7	51.5	320 57.0	24.9	20 46.6	134	3 20.7	-124
9	210 21.7	290 28.7	31.1	356 59.9	34.9	56 41.1	51.5	335 59.2	24.9	35 19.0	135	3 33.1	-124
10	225 24.2	305 27.8	31.0	12 00.9	35.5	71 43.5	51.5	351 01.4	25.0	49 51.5	136	3 45.5	-124
11	240 26.6	320 26.8	30.8	27 01.8	36.0	86 45.8	51.5	6 03.5	25.1	64 24.1	135	3 57.9	-124
12	255 29.1	335 25.8	-24 30.7	42 02.6	-12 36.6	101 48.2	+11 51.4	21 05.7	-17 25.1	78 56.6	135 -	4 10.3	-123
13	270 31.5	350 24.9	30.5	57 03.5	37.1	116 50.6	51.4	36 07.9	25.2	93 29.1	136	4 22.6	-123
14	285 34.0	5 23.9	30.4	72 04.4	37.7	131 53.0	51.4	51 10.1	25.3	108 01.7	136	4 34.9	-123
15	300 36.5	20 23.0	30.2	87 05.3	38.2	146 55.4	51.4	66 12.2	25.3	122 34.3	136	4 47.2	-122
16	315 38.9	35 22.0	30.1	102 06.2	38.8	161 57.7	51.4	81 14.4	25.4	137 06.9	135	4 59.4	-122
17	330 41.4	50 21.1	29.9	117 07.1	39.3	177 00.1	51.3	96 16.6	25.5	151 39.4	137	5 11.6	-122
18	345 43.9	65 20.1	-24 29.8	132 08.0	-12 39.9	192 02.5	+11 51.3	111 18.7	-17 25.5	166 12.1	136 -	5 23.8	-121
19	0 46.3	80 19.2	29.6	147 08.9	40.5	207 04.9	51.3	126 20.9	25.6	180 44.7	136	5 35.9	-121
20	15 48.8	95 18.2	29.5	162 09.8	41.0	222 07.3	51.3	141 23.1	25.7	195 17.3	136	5 48.0	-121
21	30 51.3	110 17.3	29.3	177 10.7	41.6	237 09.6	51.3	156 25.2	25.7	209 49.9	137	6 00.1	-120
22	45 53.7	125 16.4	29.2	192 11.6	42.1	252 12.0	51.2	171 27.4	25.8	224 22.6	136	6 12.1	-120
23	60 56.2	140 15.4	29.0	207 12.5	42.7	267 14.4	51.2	186 29.6	25.9	238 55.2	137	6 24.1	-119
8 0	75 58.6	155 14.5	-24 28.8	222 13.4	-12 43.2	282 16.8	+11 51.2	201 31.8	-17 25.9	253 27.9	136 -	6 36.0	-119
1	91 01.1	170 13.5	28.7	237 14.3	43.8	297 19.2	51.2	216 33.9	26.0	268 00.5	137	6 47.9	-118
2	106 03.6	185 12.6	28.5	252 15.2	44.3	312 21.5	51.2	231 36.1	26.1	282 33.2	137	6 59.7	-118
3	121 06.0	200 11.6	28.4	267 16.1	44.9	327 23.9	51.1	246 38.3	26.1	297 05.9	136	7 11.6	-117
4	136 08.5	215 10.7	28.2	282 17.0	45.4	342 26.3	51.1	261 40.4	26.2	311 38.5	137	7 23.3	-117
5	151 11.0	230 09.7	28.0	297 17.9	46.0	357 28.7	51.1	276 42.6	26.3	326 11.2	137	7 35.0	-117
6	166 13.4	245 08.8	-24 27.9	312 18.8	-12 46.5	12 31.1	+11 51.1	291 44.8	-17 26.3	340 43.9	137 -	7 46.7	-116
7	181 15.9	260 07.8	27.7	327 19.7	47.1	27 33.5	51.1	306 46.9	26.4	355 16.6	136	7 58.3	-116
8	196 18.4	275 06.9	27.5	342 20.6	47.6	42 35.8	51.1	321 49.1	26.5	9 49.2	137	8 09.9	-116
9	211 20.8	290 05.9	27.4	357 21.5	48.2	57 38.2	51.0	336 51.3	26.5	24 21.9	137	8 21.5	-115
10	226 23.3	305 05.0	27.2	12 22.4	48.7	72 40.6	51.0	351 53.5	26.6	38 54.6	136	8 33.0	-114
11	241 25.8	320 04.0	27.0	27 23.3	49.3	87 43.0	51.0	6 55.6	26.6	53 27.2	137	8 44.4	-114
12	256 28.2	335 03.1	-24 26.8	42 24.2	-12 49.8	102 45.4	+11 51.0	21 57.8	-17 26.7	67 59.9	136 -	8 55.8	-113
13	271 30.7	350 02.1	26.7	57 25.1	50.4	117 47.8	51.0	37 00.0	26.8	82 32.5	137	9 07.1	-113
14	286 33.1	5 01.2	26.5	72 26.0	50.9	132 50.2	50.9	52 02.1	26.8	97 05.2	136	9 18.4	-113
15	301 35.6	20 00.2	26.3	87 26.9	51.5	147 52.5	50.9	67 04.3	26.9	111 37.8	137	9 29.7	-112
16	316 38.1	34 59.3	26.1	102 27.8	52.0	162 54.9	50.9	82 06.5	27.0	126 10.5	136	9 40.9	-111
17	331 40.5	49 58.3	25.9	117 28.7	52.6	177 57.3	50.9	97 08.7	27.0	140 43.1	136	9 52.0	-111
18	346 43.0	64 57.4	-24 25.7	132 29.6	-12 53.1	192 59.7	+11 50.9	112 10.8	-17 27.1	155 15.7	136	-10 03.1	-110
19	1 45.5	79 56.5	25.6	147 30.5	53.7	208 02.1	50.9	127 13.0	27.2	169 48.3	136	10 14.1	-110
20	16 47.9	94 55.5	25.4	162 31.4	54.2	223 04.5	50.8	142 15.2	27.2	184 20.9	136	10 25.1	-109
21	31 50.4	109 54.6	25.2	177 32.3	54.8	238 06.9	50.8	157 17.3	27.3	198 53.5	136	10 36.0	-109
22	46 52.9	124 53.6	25.0	192 33.2	55.3	253 09.3	50.8	172 19.5	27.4	213 26.1	136	10 46.9	-108
23	61 55.3	139 52.7	24.8	207 34.1	55.9	268 11.6	50.8	187 21.7	27.4	227 58.7	135	10 57.7	-108
24	76 57.8	154 51.7	-24 24.6	222 35.0	-12 56.4	283 14.0	+11 50.8	202 23.9	-17 27.5	242 31.2	135	-11 08.5	-107
code	-	- 9	+ 2	+ 9	- 5	+ 24	0	+ 22	- 1				

G M T	SUN				STARS				Lat.	Sunrise	Twilt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS			
	GHA		Dec.	No.	Name	SHA	Dec.					Alt.	Sun's Low'r Limb	Venus	Mars				
	h	m						6								7	8	9	
6	0	182 20.9	-22 22.4	7	Acamar	315 50.6	-40 28.9	72	■	6 34	24 48	0 48	2 44	4 44					
	1	197 20.7	22.7		5	Achernar	335 58.3	-57 27.7	70	■	6 27	24 45	0 45	2 32	4 21				
	2	212 20.4	23.0		30	Acruz	173 57.9	-62 51.1	68	11 13	6 20	24 43	0 43	2 23	4 04				
	3	227 20.2	23.3		19	Adhara	255 46.1	-28 54.6	66	10 05	6 15	24 41	0 41	2 16	3 50				
	4	242 19.9	23.7		10	Aldebaran	291 38.5	+16 25.4	64	9 30	6 10	24 39	0 39	2 10	3 39				
	5	257 19.6	24.0						62	9 05	6 06	24 38	0 38	2 04	3 30				
	6	272 19.4	-22 24.3		32	Alioth	166 58.7	+56 11.6	60	8 45	6 01	24 37	0 37	2 00	3 21				
	7	287 19.1	24.6		34	Alkaid	153 33.1	+49 31.7	58	8 29	5 57	24 36	0 36	1 56	3 14				
	8	302 18.9	24.9		55	Al Na'ir	28 37.9	-47 10.6	56	8 15	5 54	24 35	0 35	1 52	3 08				
	9	317 18.6	25.2		15	Alnilam	276 29.8	-1 13.7	54	8 03	5 51	24 34	0 34	1 49	3 02				
	10	332 18.3	25.5		25	Alphard	218 38.3	-8 28.0	52	7 53	5 47	24 33	0 33	1 46	2 57				
	11	347 18.1	25.8						50	7 43	5 44	24 33	0 33	1 43	2 53				
	12	2 17.8	-22 26.2		41	Alphecca	126 47.9	+26 51.7	45	7 24	5 37	24 31	0 31	1 38	2 43				
	13	17 17.5	26.5		1	Alpheratz	358 28.1	+28 51.1	40	7 08	5 30	24 30	0 30	1 33	2 35				
	14	32 17.3	26.8		51	Altair	62 50.5	+8 45.2	35	6 54	5 23	24 29	0 29	1 29	2 28				
	15	47 17.0	27.1		2	Ankaa	353 58.0	-42 32.8	30	6 42	5 17	24 28	0 28	1 25	2 22				
	16	62 16.8	27.4		42	Antares	113 19.6	-26 20.1	20	6 22	5 03	24 26	0 26	1 19	2 11				
	17	77 16.5	27.7						10	6 04	4 49	24 25	0 25	1 14	2 02				
	18	92 16.2	-22 28.0		37	Arcturus	146 35.3	+19 24.6	0	5 48	4 32	24 23	0 23	1 09	1 54				
	19	107 16.0	28.3		43	Atria	109 00.7	-68 56.9	10	5 31	4 13	24 22	0 22	1 04	1 45				
	20	122 15.7	28.6		22	Avior	234 35.3	-59 21.9	20	5 12	3 49	24 21	0 21	0 59	1 36				
	21	137 15.4	28.9		13	Bellatrix	279 17.9	+6 18.7	30	4 51	3 16	24 19	0 19	0 53	1 26				
	22	152 15.2	29.2		16	Betelge'se	271 47.6	+7 24.0	35	4 39	2 54	24 19	0 19	0 49	1 21				
	23	167 14.9	29.5						40	4 25	2 25	24 18	0 18	0 45	1 14				
					17	Canopus	264 14.8	-52 40.2	45	4 07	1 41	24 16	0 16	0 41	1 06				
					12	Capella	281 37.7	+45 57.3	50	3 46	///	24 15	0 15	0 36	0 57				
					53	Deneb	50 01.2	+45 07.6	52	3 36	///	24 15	0 15	0 33	0 53				
					28	Denebola	183 17.6	+14 48.9	54	3 24	///	24 14	0 14	0 31	0 48				
					4	Diphda	349 38.9	-18 13.7	56	3 11	///	24 13	0 13	0 28	0 43				
									58	2 56	///	0 01	0 13	0 25	0 38				
					27	Dubhe	194 44.4	+61 59.0	60	2 37	///	0 02	0 12	0 21	0 31				
					14	Elnath	279 06.8	+28 34.3											
					47	Eltanin	91 06.7	+51 29.7											
					54	Enif	34 29.6	+9 40.5											
					56	Fomalhaut	16 11.5	-29 51.4											
					31	Gacrux	172 49.3	-56 51.8	72	■	17 05	12 09	11 51	11 31	11 06				
					29	Gienah	176 36.8	-17 17.8	70	■	17 13	12 08	11 57	11 45	11 30				
					35	Hadar	149 49.7	-60 09.5	68	12 29	17 20	12 07	12 01	11 55	11 49				
					6	Hamal	328 49.2	+23 15.5	66	13 37	17 25	12 07	12 05	12 04	12 03				
					48	Kaus Aust.	84 41.4	-34 24.4	64	14 12	17 30	12 06	12 09	12 12	12 16				
									62	14 38	17 36	12 05	12 12	12 18	12 26				
					40	Kochab	137 19.0	+74 19.9	60	14 57	17 39	12 05	12 14	12 24	12 35				
					57	Markab	14 21.3	+14 58.3	58	15 13	17 43	12 05	12 17	12 29	12 43				
					8	Menkar	314 59.9	+3 55.2	56	15 27	17 47	12 04	12 19	12 34	12 50				
					36	Menkent	148 58.8	-36 09.1	54	15 39	17 51	12 04	12 21	12 38	12 57				
					24	Miap'l'dus	221 48.5	-69 31.9	52	15 50	17 54	12 04	12 22	12 42	13 02				
									50	15 59	17 57	12 03	12 24	12 45	13 07				
					9	Mirfak	309 41.7	+49 42.5	45	16 19	18 05	12 03	12 27	12 52	13 18				
					50	Nunki	76 52.0	-26 21.2	40	16 35	18 12	12 02	12 30	12 58	13 28				
					52	Peacock	54 27.5	-56 52.8	35	16 48	18 18	12 02	12 33	13 04	13 36				
					21	Pollux	244 20.1	+28 07.9	30	17 00	18 25	12 01	12 35	13 08	13 43				
					20	Procyon	245 44.6	+5 20.3	20	17 20	18 38	12 01	12 39	13 16	13 55				
									10	17 38	18 53	12 00	12 42	13 24	14 06				
					46	R'alguae	96 46.8	+12 35.5	0	17 55	19 10	11 59	12 45	13 30	14 16				
					26	Regulus	208 29.3	+12 10.9	10	18 12	19 29	11 59	12 48	13 37	14 26				
					11	Rigel	281 53.1	-8 15.0	20	18 30	19 53	11 58	12 52	13 44	14 37				
					38	Rigel Kent.	140 51.3	-60 39.2	30	18 51	20 26	11 57	12 55	13 53	14 49				
					44	Sabik	103 02.4	-15 40.3	35	19 04	20 49	11 57	12 58	13 57	14 56				
									40	19 18	21 19	11 56	13 00	14 03	15 04				
					3	Schedar	350 29.5	+56 18.1	45	19 35	22 02	11 55	13 03	14 09	15 14				
					45	Shaula	97 20.9	-37 04.4	50	19 57	///	11 54	13 07	14 17	15 26				
					18	Sirius	259 11.4	-16 39.2	52	20 07	///	11 54	13 08	14 20	15 31				
					33	Spica	159 16.9	-10 55.9	54	20 19	///	11 54	13 10	14 24	15 37				
					23	Suhail	223 24.0	-43 15.1	56	20 32	///	11 53	13 12	14 29	15 44				
									58	20 47	///	11 53	13 14	14 33	15 51				
					49	Vega	81 08.6	+38 44.7	60	21 06	///	11 52	13 16	14 39	16 00				
					39	Zub'g'bi	137 53.5	-15 51.6											

G M T	T GHA	VENUS -3.3		MARS 1.9		JUPITER -1.8		SATURN 0.7		MOON			
		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
9 0	76 57.8	154 51.7	-24 24.6	222 35.0	-12 56.4	283 14.0	+11 50.8	202 23.9	-17 27.5	242 31.2	135	-11 08.5	-107
1	92 00.3	169 50.8	24.4	237 35.9	57.0	298 16.4	50.8	217 26.0	27.6	257 03.7	136	11 19.2	-106
2	107 02.7	184 49.8	24.2	252 36.8	57.5	313 18.8	50.7	232 28.2	27.6	271 36.3	135	11 29.8	-106
3	122 05.2	199 48.9	.. 24.0	267 37.7	.. 58.1	328 21.2	.. 50.7	247 30.4	.. 27.7	286 08.8	135	.. 11 40.4	-105
4	137 07.6	214 48.0	23.8	282 38.6	58.6	343 23.6	50.7	262 32.5	27.8	300 41.3	135	11 50.9	-105
5	152 10.1	229 47.0	23.6	297 39.4	58.6	358 26.0	50.7	277 34.7	27.8	315 13.8	134	12 01.4	-104
6	167 12.6	244 46.1	-24 23.5	312 40.3	-12 59.7	13 28.4	+11 50.7	292 36.9	-17 27.9	329 46.2	135	-12 11.8	-103
7	182 15.0	259 45.1	23.2	327 41.2	13 00.3	28 30.8	50.7	307 39.1	28.0	344 18.7	134	12 22.1	-103
8	197 17.5	274 44.2	23.0	342 42.1	00.8	43 33.2	50.6	322 41.2	28.0	358 51.1	134	12 32.4	-102
9	212 20.0	289 43.2	.. 22.8	357 43.0	.. 01.4	58 35.5	.. 50.6	337 43.4	.. 28.1	13 23.5	134	.. 12 42.6	-101
10	227 22.4	304 42.3	22.6	12 43.9	01.9	73 37.9	50.6	352 45.6	28.1	27 55.9	132	12 52.7	-101
11	242 24.9	319 41.4	22.4	27 44.8	02.5	88 40.3	50.6	7 47.7	28.2	42 28.3	133	13 02.8	-100
12	257 27.4	334 40.4	-24 22.2	42 45.7	-13 03.0	103 42.7	+11 50.6	22 49.9	-17 28.3	57 00.6	134	-13 12.8	-100
13	272 29.8	349 39.5	22.0	57 46.6	03.6	118 45.1	50.6	37 52.1	28.3	71 33.0	133	13 22.8	-98
14	287 32.3	4 38.5	21.8	72 47.5	04.1	133 47.5	50.6	52 54.3	28.4	86 05.3	133	13 32.6	-99
15	302 34.8	19 37.6	.. 21.6	87 48.4	.. 04.7	148 49.9	.. 50.5	67 56.4	.. 28.5	100 37.6	133	.. 13 42.5	-97
16	317 37.2	34 36.6	21.4	102 49.3	05.2	163 52.3	50.5	82 58.6	28.5	115 09.9	132	13 52.2	-97
17	332 39.7	49 35.7	21.2	117 50.2	05.8	178 54.7	50.5	98 00.8	28.6	129 42.1	133	14 01.9	-96
18	347 42.1	64 34.8	-24 21.0	132 51.1	-13 06.3	193 57.1	+11 50.5	113 03.0	-17 28.7	144 14.4	132	-14 11.5	-95
19	2 44.6	79 33.8	20.7	147 52.0	06.8	208 59.5	50.5	128 05.1	28.7	158 46.6	132	14 21.0	-95
20	17 47.1	94 32.9	20.5	162 52.9	07.4	224 01.9	50.5	143 07.3	28.8	173 18.8	131	14 30.5	-94
21	32 49.5	109 31.9	.. 20.3	177 53.8	.. 07.9	239 04.3	.. 50.5	158 09.5	.. 28.9	187 50.9	132	.. 14 39.9	-93
22	47 52.0	124 31.0	20.1	192 54.6	08.5	254 06.7	50.4	173 11.6	28.9	202 23.1	131	14 49.2	-93
23	62 54.5	139 30.1	19.9	207 55.5	09.0	269 09.1	50.4	188 13.8	29.0	216 55.2	131	14 58.5	-92
10 0	77 56.9	154 29.1	-24 19.7	222 56.4	-13 09.6	284 11.5	+11 50.4	203 16.0	-17 29.1	231 27.3	130	-15 07.7	-91
1	92 59.4	169 28.2	19.4	237 57.3	10.1	299 13.9	50.4	218 18.2	29.1	245 59.3	131	15 16.8	-90
2	108 01.9	184 27.2	19.2	252 58.2	10.7	314 16.3	50.4	233 20.3	29.2	260 31.4	130	15 25.8	-90
3	123 04.3	199 26.3	.. 19.0	267 59.1	.. 11.2	329 18.7	.. 50.4	248 22.5	.. 29.2	275 03.4	130	.. 15 34.8	-89
4	138 06.8	214 25.4	18.8	283 00.0	11.8	344 21.1	50.4	263 24.7	29.3	289 35.4	129	15 43.7	-88
5	153 09.2	229 24.4	18.5	298 00.9	12.3	359 23.5	50.3	278 26.8	29.4	304 07.3	130	15 52.5	-87
6	168 11.7	244 23.5	-24 18.3	313 01.8	-13 12.8	14 25.8	+11 50.3	293 29.0	-17 29.4	318 39.3	129	-16 01.2	-87
7	183 14.2	259 22.6	18.1	328 02.7	13.4	29 28.2	50.3	308 31.2	29.5	333 11.2	129	16 09.9	-86
8	198 16.6	274 21.6	17.8	343 03.6	13.9	44 30.6	50.3	323 33.4	29.6	347 43.1	128	16 18.5	-85
9	213 19.1	289 20.7	.. 17.6	358 04.5	.. 14.5	59 33.0	.. 50.3	338 35.5	.. 29.6	2 14.9	128	.. 16 27.0	-84
10	228 21.6	304 19.7	17.4	13 05.3	15.0	74 35.4	50.3	353 37.7	29.7	16 46.7	128	16 35.4	-83
11	243 24.0	319 18.8	17.1	28 06.2	15.6	89 37.8	50.3	8 39.9	29.8	31 18.5	128	16 43.7	-83
12	258 26.5	334 17.9	-24 16.9	43 07.1	-13 16.1	104 40.2	+11 50.3	23 42.1	-17 29.8	45 50.3	128	-16 52.0	-82
13	273 29.0	349 16.9	16.6	58 08.0	16.6	119 42.6	50.2	38 44.2	29.9	60 22.1	127	17 00.2	-81
14	288 31.4	4 16.0	16.4	73 08.9	17.2	134 45.0	50.2	53 46.4	30.0	74 53.8	127	17 08.3	-80
15	303 33.9	19 15.1	.. 16.2	88 09.8	.. 17.7	149 47.5	.. 50.2	68 48.6	.. 30.0	89 25.5	126	.. 17 16.3	-79
16	318 36.4	34 14.1	15.9	103 10.7	18.3	164 49.9	50.2	83 50.8	30.1	103 57.1	127	17 24.2	-79
17	333 38.8	49 13.2	15.7	118 11.6	18.8	179 52.3	50.2	98 52.9	30.1	118 28.8	126	17 32.1	-78
18	348 41.3	64 12.3	-24 15.4	133 12.5	-13 19.4	194 54.7	+11 50.2	113 55.1	-17 30.2	133 00.4	126	-17 39.9	-77
19	3 43.7	79 11.3	15.2	148 13.4	19.9	209 57.1	50.2	128 57.3	30.3	147 32.0	125	17 47.6	-76
20	18 46.2	94 10.4	14.9	163 14.2	20.4	224 59.5	50.2	143 59.4	30.3	162 03.5	125	17 55.2	-75
21	33 48.7	109 09.4	.. 14.7	178 15.1	.. 21.0	240 01.9	.. 50.2	159 01.6	.. 30.4	176 35.0	125	.. 18 02.7	-74
22	48 51.1	124 08.5	14.4	193 16.0	21.5	255 04.3	50.1	174 03.8	30.5	191 06.5	125	18 10.1	-73
23	63 53.6	139 07.6	14.2	208 16.9	22.1	270 06.7	50.1	189 06.0	30.5	205 38.0	124	18 17.4	-73
11 0	78 56.1	154 06.6	-24 13.9	223 17.8	-13 22.6	285 09.1	+11 50.1	204 08.1	-17 30.6	220 09.4	124	-18 24.7	-72
1	93 58.5	169 05.7	13.7	238 18.7	23.2	300 11.5	50.1	219 10.3	30.7	234 40.8	124	18 31.9	-71
2	109 01.0	184 04.8	13.4	253 19.6	23.7	315 13.9	50.1	234 12.5	30.7	249 12.2	123	18 39.0	-70
3	124 03.5	199 03.8	.. 13.2	268 20.5	.. 24.2	330 16.3	.. 50.1	249 14.7	.. 30.8	263 43.5	124	.. 18 46.0	-69
4	139 05.9	214 02.9	12.9	283 21.4	24.8	345 18.7	50.1	264 16.8	30.9	278 14.9	123	18 52.9	-68
5	154 08.4	229 02.0	12.7	298 22.2	25.3	0 21.1	50.1	279 19.0	30.9	292 46.2	122	18 59.7	-67
6	169 10.9	244 01.0	-24 12.4	313 23.1	-13 25.9	15 23.5	+11 50.1	294 21.2	-17 31.0	307 17.4	123	-19 06.4	-66
7	184 13.3	259 00.1	12.1	328 24.0	26.4	30 25.9	50.0	309 23.4	31.0	321 48.7	122	19 13.0	-66
8	199 15.8	273 59.2	11.9	343 24.9	26.9	45 28.3	50.0	324 25.5	31.1	336 19.9	122	19 19.6	-64
9	214 18.2	288 58.2	.. 11.6	358 25.8	.. 27.5	60 30.7	.. 50.0	339 27.7	.. 31.2	350 51.1	121	.. 19 26.0	-64
10	229 20.7	303 57.3	11.3	13 26.7	28.0	75 33.1	50.0	354 29.9	31.2	5 22.2	121	19 32.4	-63
11	244 23.2	318 56.4	11.1	28 27.6	28.6	90 35.5	50.0	9 32.0	31.3	19 53.3	121	19 38.7	-61
12	259 25.6	333 55.5	-24 10.8	43 28.5	-13 29.1	105 38.0	+11 50.0	24 34.2	-17 31.4	34 24.4	121	-19 44.8	-61
13	274 28.1	348 54.5	10.5	58 29.4	29.6	120 40.4	50.0	39 36.4	31.4	48 55.5	120	19 50.9	-60
14	289 30.6	3 53.6	10.3	73 30.2	30.2	135 42.8	50.0	54 38.6	31.5	63 26.5	121	19 56.9	-59
15	304 33.0	18 52.7	.. 10.0	88 31.1	.. 30.7	150 45.2	.. 50.0	69 40.7	.. 31.6	77 57.6	119	.. 20 02.8	-58
16	319 35.5	33 51.7	09.7	103 32.0	31.3	165 47.6	50.0	84 42.9	31.6	92 28.5	120	20 08.6	-57
17	334 38.0	48 50.8	09.4	118 32.9	31.8	180 50.0	50.0	99 45.1	31.7	106 59.5	119	20 14.3	-56
18	349 40.4	63 49.9	-24 09.2	133 33.8	-13 32.3	195 52.4	+11 49.9	114 47.3	-17 31.7	121 30.4	120	-20 19.9	-55
19	4 42.9	78 48.9	08.9	148 34.7	32.9	210 54.8	49.9	129 49.4	31.8	136 01.4	118	20 25.4	-54
20	19 45.3	93 48.0	08.6	163 35.6	33.4	225 57.2	49.9	144 51.6	31.9	150 32.2	119	20 30.8	-53
21	34 47.8	108 47.1	.. 08.3	178 36.4	.. 34.0	240 59.6	.. 49.9	159 53.8	.. 31.9	165 03.1	118	.. 20 36.1	-52
22	49 50.3	123 46.2	08.0	193 37.3	34.5	256 02.1	49.9	174 56.0	32.0	179 33.9	119	20 41.3	-52
23	64 52.7	138 45.2	07.8	208 38.2	35.0	271 04.5	49.9	189 58.1	32.1	194 04.8	117	20 46.5	-50
24	79 55.2	153 44.3	-24 07.5	223 39.1	-13 35.6	286 06.9	+11 49.9	205 00.3	-17 32.1	208 35.5	118	-20 51.5	-49
code	-	- 10	+ 3	+ 9	- 5	+ 24	- 1	+ 21	- 1				

G M T	SUN			STARS			Lat.	Sunrise	Twilt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS										
	GHA	Dec.	No.	Name	SHA	Dec.				9	10	11	12	Alt.	Sun's Low'r Limb	Venus	Mars							
h	°	'	°	°	'	°	N.	h	m	h	m	h	m	h	m	h	m	h	m	h	m	h	m	
9	0	182	01.7	-22	43.3	7	Acamar	315	50.6	-40	28.9	72	■	6	40	4	44	7	03	■	■	■	■	
1	1	197	01.4		43.6	5	Achernar	335	58.4	-57	27.7	70	■	6	32	4	21	6	17	8	42	■	■	
2	2	212	01.2		43.8	30	Acruv	173	57.8	-62	51.1	68	■	6	25	4	04	5	47	7	36	9	43	
3	3	227	00.9		44.1	19	Adhara	255	46.1	-28	54.6	66	10 14	6	19	3	50	5	25	7	01	8	34	
4	4	242	00.6		44.3	10	Aldebaran	291	38.5	+16	25.4	64	9 36	6	14	3	39	5	08	6	35	7	58	
5	5	257	00.3		44.6							62	9 10	6	09	3	30	4	54	6	15	7	32	
6	6	272	00.0	-22	44.9	32	Alioth	166	58.7	+56	11.6	60	8 50	6	05	3	21	4	42	5	59	7	12	
7	7	286	59.8		45.1	34	Alkaid	153	33.1	+49	31.7	58	8 33	6	01	3	14	4	31	5	46	6	55	
8	8	301	59.5		45.4	55	Al Na'ir	28	37.9	-47	10.6	56	8 19	5	58	3	08	4	22	5	34	6	42	
9	9	316	59.2		45.6	13	Ahijlam	276	29.8	-1	13.7	54	8 07	5	54	3	02	4	14	5	24	6	29	
10	10	331	58.9		45.9	25	Alphard	218	98.3	-8	28.0	52	7 56	5	50	2	57	4	07	5	15	6	19	
11	11	346	58.7		46.1							50	7 47	5	48	2	53	4	01	5	07	6	09	
12	12	1	58.4	-22	46.4	41	Alphecca	126	47.8	+26	51.6	45	7 27	5	40	2	43	3	47	4	50	5	50	
13	13	16	58.1		46.6	1	Alpheratz	358	28.1	+28	51.1	40	7 10	5	32	2	35	3	36	4	36	5	33	
14	14	31	57.8		46.9	51	Altair	62	50.5	+8	45.2	35	6 57	5	26	2	28	3	26	4	24	5	20	
15	15	46	57.6		47.2	2	Ankaa	353	58.0	-42	32.8	30	6 45	5	19	2	22	3	18	4	14	5	08	
16	16	61	57.3		47.4	42	Antares	113	19.5	-26	20.1	20	6 24	5	05	2	11	3	04	3	56	4	48	
17	17	76	57.0		47.7							10	6 06	4	50	2	02	2	51	3	41	4	31	
18	18	91	56.7	-22	47.9	37	Arcturus	146	35.3	+19	24.5	0	5 49	4	33	1	54	2	40	3	26	4	14	
19	19	106	56.4		48.1	43	Atria	109	00.7	-68	56.9	10	5 32	4	14	1	45	2	28	3	12	3	58	
20	20	121	56.2		48.4	22	Avior	234	35.2	-59	21.9	20	5 13	3	49	1	36	2	16	2	57	3	41	
21	21	136	55.9		48.6	13	Bellatrix	279	17.9	+6	18.7	30	4 52	3	16	1	26	2	02	2	40	3	21	
22	22	151	55.6		48.9	16	Betelge'se	271	47.6	+7	24.0	35	4 39	2	53	1	21	1	54	2	30	3	10	
23	23	166	55.3		49.1							40	4 24	2	23	1	14	1	45	2	18	2	56	
						17	Canopus	264	14.8	-52	40.2	45	4 07	1	38	1	06	1	34	2	05	2	41	
						12	Capella	281	37.7	+45	57.3	50	3 45	///	///	0	57	1	21	1	49	2	22	
						53	Deneb	50	01.2	+45	07.6	52	3 35	///	///	0	53	1	15	1	41	2	13	
						28	Denebola	183	17.6	+14	48.9	54	3 23	///	///	0	48	1	09	1	33	2	03	
						4	Diphda	349	39.0	+18	13.7	56	3 09	///	///	0	43	1	01	1	23	1	51	
												58	2 53	///	///	0	38	0	53	1	13	1	38	
												60	2 34	///	///	0	31	0	44	1	00	1	23	
												S												
												Lat.	Sunset	Twilt. ends	Moonset									
												N.	h	m	h	m	h	m	h	m	h	m	h	m
						31	Gacrux	172	49.2	-56	51.8	72	■	17	03	11	06	10	23	■	■	■	■	
						29	Gienah	176	36.8	-17	17.8	70	■	17	11	11	30	11	10	10	22	■	■	
						35	Hadar	149	49.6	-60	09.5	68	■	17	18	11	49	11	41	11	30	11	02	
						6	Hamal	328	49.2	+23	15.5	66	13 31	17	24	12	03	12	04	12	06	12	13	
						48	Kaus Aust.	84	41.4	-34	24.4	64	14 08	17	29	12	16	12	22	12	32	12	49	
												62	14 35	17	35	12	26	12	37	12	52	13	15	
						40	Kochab	137	19.0	+74	19.9	60	14 55	17	39	12	35	12	50	13	09	13	35	
						57	Markab	14	21.3	+14	58.3	58	15 12	17	43	12	43	13	00	13	23	13	52	
						8	Menkar	314	59.9	+3	55.2	56	15 26	17	47	12	50	13	10	13	35	14	06	
						36	Menkent	148	58.8	-36	09.1	54	15 38	17	50	12	57	13	18	13	45	14	19	
						24	Miaplidos	221	48.5	-69	31.9	52	15 49	17	54	13	02	13	26	13	55	14	30	
												50	15 58	17	57	13	07	13	33	14	03	14	39	
						9	Mirfak	309	41.7	+49	42.5	45	16 18	18	04	13	18	13	48	14	21	15	00	
						50	Nunki	76	52.0	-26	21.2	40	16 35	18	12	13	28	14	00	14	36	15	16	
						52	Peacock	54	27.5	-56	52.8	35	16 49	18	19	13	36	14	10	14	48	15	30	
						21	Pollux	244	20.1	+28	07.9	30	17 01	18	26	13	43	14	19	14	59	15	42	
						20	Procyon	245	44.5	+5	20.3	20	17 21	18	39	13	55	14	35	15	18	16	03	
												10	17 39	18	54	14	06	14	49	15	34	16	21	
						46	R'alhague	96	46.8	+12	35.5	0	17 56	19	11	14	16	15	02	15	49	16	38	
						26	Regulus	208	29.2	+12	10.8	10	18 13	19	30	14	26	15	15	16	05	16	55	
						11	Rigel	281	53.1	-8	15.1	20	18 32	19	56	14	37	15	29	16	21	17	13	
						38	Rigel Kent	140	51.3	-60	39.2	30	18 53	20	29	14	49	15	45	16	40	17	34	
						44	Sabik	103	02.3	-15	40.3	35	19 06	20	52	14	56	15	54	16	51	17	46	
												40	19 21	21	23	15	04	16	05	17	04	18	00	
						3	Schedar	350	29.6	+56	18.1	45	19 38	22	08	15	14	16	17	17	19	18	17	
						45	Shaula	97	20.9	-37	04.4	50	20 00	///	///	15	26	16	33	17	37	18	37	
						18	Sirius	259	11.4	-16	39.2	52	20 11	///	///	15	31	16	40	17	46	18	47	
						33	Spica	159	16.9	-10	55.9	54	20 22	///	///	15	37	16	48	17	56	18	58	
						23	Suhail	223	24.0	-43	15.1	56	20 36	///	///	15	44	16	57	18	07	19	11	
												58	20 52	///	///	15	51	17	07	18	19	19	25	
						49	Vega	81	08.6	+38	44.6	60	21 12	///	///	16	00	17	19	18				

G M T	T GHA	VENUS -3.3		MARS 1.8		JUPITER -1.8		SATURN 0.7		MOON			
		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
12 0	79 55.2	153 44.3	-24 07.5	223 39.1	-13 35.6	286 06.9	+11 49.9	205 00.3	-17 32.1	208 35.5	118	-20 51.5	-49
1 1	94 57.7	168 43.4	07.2	238 40.0	36.1	301 09.3	49.9	220 02.5	32.2	223 06.3	118	20 56.4	-48
2 2	110 00.1	183 42.5	06.9	253 40.9	36.6	316 11.7	49.9	235 04.7	32.3	237 37.1	117	21 01.2	-48
3 3	125 02.6	198 41.5	06.6	268 41.8	37.2	331 14.1	49.9	250 06.8	32.3	252 07.8	117	21 06.0	-46
4 4	140 05.1	213 40.6	06.3	283 42.6	37.7	346 16.5	49.9	265 09.0	32.4	266 38.5	116	21 10.6	-45
5 5	155 07.5	228 39.7	06.0	298 43.5	38.3	1 18.9	49.9	280 11.2	32.4	281 09.1	117	21 15.1	-44
6 6	170 10.0	243 38.7	-24 05.8	313 44.4	-13 38.8	16 21.4	+11 49.8	295 13.4	-17 32.5	295 39.8	116	-21 19.5	-43
7 7	185 12.5	258 37.8	05.5	328 45.3	39.3	31 23.8	49.8	310 15.5	32.6	310 10.4	116	21 23.8	-43
8 8	200 14.9	273 36.9	05.2	343 46.2	39.9	46 26.2	49.8	325 17.7	32.6	324 41.0	116	21 28.1	-41
9 9	215 17.4	288 36.0	04.9	358 47.1	40.4	61 28.6	49.8	340 19.9	32.7	339 11.6	116	-21 32.2	-40
10 10	230 19.8	303 35.0	04.6	13 48.0	40.9	76 31.0	49.8	355 22.1	32.8	353 42.2	115	21 36.2	-39
11 11	245 22.3	318 34.1	04.3	28 48.8	41.5	91 33.4	49.8	10 24.2	32.8	8 12.7	116	21 40.1	-38
12 12	260 24.8	333 33.2	-24 04.0	43 49.7	-13 42.0	106 35.8	+11 49.8	25 26.4	-17 32.9	22 43.3	115	-21 43.9	-37
13 13	275 27.2	348 32.3	03.7	58 50.6	42.5	121 38.3	49.8	40 28.6	33.0	37 13.8	115	21 47.6	-36
14 14	290 29.7	3 31.3	03.4	73 51.5	43.1	136 40.7	49.8	55 30.8	33.0	51 44.3	115	21 51.2	-35
15 15	305 32.2	18 30.4	03.1	88 52.4	43.6	151 43.1	49.8	70 32.9	33.1	66 14.8	114	-21 54.7	-34
16 16	320 34.6	33 29.5	02.8	103 53.3	44.1	166 45.5	49.8	85 35.1	33.1	80 45.2	115	21 58.1	-33
17 17	335 37.1	48 28.6	02.5	118 54.1	44.7	181 47.9	49.8	100 37.3	33.2	95 15.7	114	22 01.4	-32
18 18	350 39.6	63 27.7	-24 02.2	133 55.0	-13 45.2	196 50.3	+11 49.8	115 39.5	-17 33.3	109 46.1	114	-22 04.6	-31
19 19	5 42.0	78 26.7	01.9	148 55.9	45.8	211 52.8	49.8	130 41.6	33.3	124 16.5	114	22 07.7	-29
20 20	20 44.5	93 25.8	01.5	163 56.8	46.3	226 55.2	49.8	145 43.8	33.4	138 46.9	114	22 10.6	-29
21 21	35 47.0	108 24.9	01.2	178 57.7	46.8	241 57.6	49.8	160 46.0	33.5	153 17.3	114	-22 13.5	-28
22 22	50 49.4	123 24.0	00.9	193 58.6	47.4	257 00.0	49.8	175 48.2	33.5	167 47.7	114	22 16.3	-26
23 23	65 51.9	138 23.1	00.6	208 59.4	47.9	272 02.4	49.7	190 50.3	33.6	182 18.1	113	22 18.9	-26
13 0	80 54.3	153 22.1	-24 00.3	224 00.3	-13 48.4	287 04.9	+11 49.7	205 52.5	-17 33.6	196 48.4	113	-22 21.5	-24
1 1	95 56.8	168 21.2	24 00.0	239 01.2	49.0	302 07.3	49.7	220 54.7	33.7	211 18.7	114	22 23.9	-24
2 2	110 59.3	183 20.3	23 59.7	254 02.1	49.5	317 09.7	49.7	235 56.9	33.8	225 49.1	113	22 26.3	-22
3 3	126 01.7	198 19.4	59.3	269 03.0	50.0	332 12.1	49.7	250 59.0	33.8	240 19.4	113	-22 28.5	-21
4 4	141 04.2	213 18.5	59.0	284 03.8	50.6	347 14.5	49.7	266 01.2	33.9	254 49.7	113	22 30.6	-21
5 5	156 06.7	228 17.5	58.7	299 04.7	51.1	2 17.0	49.7	281 03.4	34.0	269 20.0	113	22 32.7	-19
6 6	171 09.1	243 16.6	-23 58.4	314 05.6	-13 51.6	17 19.4	+11 49.7	296 05.6	-17 34.0	283 50.3	113	-22 34.6	-18
7 7	186 11.6	258 15.7	58.1	329 06.5	52.2	32 21.8	49.7	311 07.7	34.1	298 20.6	113	22 36.4	-17
8 8	201 14.1	273 14.8	57.7	344 07.4	52.7	47 24.2	49.7	326 09.9	34.1	312 50.9	112	22 38.1	-16
9 9	216 16.5	288 13.9	57.4	359 08.3	53.2	62 26.6	49.7	341 12.1	34.2	327 21.1	113	-22 39.7	-14
10 10	231 19.0	303 12.9	57.1	14 09.1	53.8	77 29.1	49.7	356 14.3	34.3	341 51.4	113	22 41.1	-14
11 11	246 21.5	318 12.0	56.8	29 10.0	54.3	92 31.5	49.7	11 16.4	34.3	356 21.7	112	22 42.5	-13
12 12	261 23.9	333 11.1	-23 56.4	44 10.9	-13 54.8	107 33.9	+11 49.7	26 18.6	-17 34.4	10 51.9	113	-22 43.8	-12
13 13	276 26.4	348 10.2	56.1	59 11.8	55.4	122 36.3	49.7	41 20.8	34.5	25 22.2	113	22 45.0	-10
14 14	291 28.8	3 09.3	55.8	74 12.7	55.9	137 38.8	49.7	56 23.0	34.5	39 52.5	112	22 46.0	-10
15 15	306 31.3	18 08.4	55.4	89 13.5	56.4	152 41.2	49.7	71 25.2	34.6	54 22.7	113	-22 47.0	-8
16 16	321 33.8	33 07.4	55.1	104 14.4	56.9	167 43.6	49.7	86 27.3	34.6	68 53.0	112	22 47.8	-7
17 17	336 36.2	48 06.5	54.8	119 15.3	57.5	182 46.0	49.7	101 29.5	34.7	83 23.2	113	22 48.5	-6
18 18	351 38.7	63 05.6	-23 54.4	134 16.2	-13 58.0	197 48.5	+11 49.7	116 31.7	-17 34.8	97 53.5	112	-22 49.1	-6
19 19	6 41.2	78 04.7	54.1	149 17.1	58.5	212 50.9	49.7	131 33.9	34.8	112 23.7	113	22 49.7	-4
20 20	21 43.6	93 03.8	53.8	164 17.9	59.1	227 53.3	49.7	146 36.0	34.9	126 54.0	112	22 50.1	-3
21 21	36 46.1	108 02.9	53.4	179 18.8	59.6	242 55.7	49.7	161 38.2	35.0	141 24.2	113	-22 50.4	-1
22 22	51 48.6	123 02.0	53.1	194 19.7	60.1	257 58.2	49.7	176 40.4	35.0	155 54.5	113	22 50.5	-1
23 23	66 51.0	138 01.0	52.7	209 20.6	60.7	273 00.6	49.7	191 42.6	35.1	170 24.8	112	22 50.6	0
14 0	81 53.5	153 00.1	-23 52.4	224 21.5	-14 01.2	288 03.0	+11 49.7	206 44.7	-17 35.1	184 55.0	113	-22 50.6	+1
1 1	96 55.9	167 59.2	52.0	239 22.3	01.7	303 05.5	49.7	221 46.9	35.2	199 25.3	113	22 50.5	+3
2 2	111 58.4	182 58.3	51.7	254 23.2	02.2	318 07.9	49.6	236 49.1	35.3	213 55.6	113	22 50.2	+3
3 3	127 00.9	197 57.4	51.3	269 24.1	02.8	333 10.3	49.6	251 51.3	35.3	228 25.9	113	-22 49.9	+5
4 4	142 03.3	212 56.5	51.0	284 25.0	03.3	348 12.7	49.6	266 53.4	35.4	242 56.2	113	22 49.4	+5
5 5	157 05.8	227 55.6	50.6	299 25.9	03.8	3 15.2	49.6	281 55.6	35.5	Partial eclipse of Sun Indian Ocean and S. W. Pacific. Annular at Djibouti, south of Ceylon, Hainan and Formosa.			
6 6	172 08.3	242 54.7	-23 50.3	314 26.7	-14 04.4	18 17.6	+11 49.6	296 57.8	-17 35.5				
7 7	187 10.7	257 53.7	49.9	329 27.6	04.9	33 20.0	49.6	312 00.0	35.6				
8 8	202 13.2	272 52.8	49.6	344 28.5	05.4	48 22.5	49.6	327 02.2	35.6				
9 9	217 15.7	287 51.9	49.2	359 29.4	06.0	63 24.9	49.6	342 04.3	35.7	329 58.2	114	22 44.4	+12
10 10	232 18.1	302 51.0	48.9	14 30.2	06.5	78 27.3	49.6	357 06.5	35.8	344 28.6	114	22 43.2	+13
11 11	247 20.6	317 50.1	48.5	29 31.1	07.0	93 29.7	49.6	12 08.7	35.8	358 59.0	114	-22 41.9	+14
12 12	262 23.1	332 49.2	-23 48.2	44 32.0	-14 07.5	108 32.2	+11 49.6	27 10.9	-17 35.9	13 29.4	114	22 40.5	+15
13 13	277 25.5	347 48.3	47.8	59 32.9	08.1	123 34.6	49.6	42 13.0	36.0	27 59.8	114	22 39.0	+17
14 14	292 28.0	2 47.4	47.4	74 33.8	08.6	138 37.0	49.6	57 15.2	36.0	42 30.2	115	-22 37.3	+17
15 15	307 30.4	17 46.5	47.1	89 34.6	09.1	153 39.5	49.6	72 17.4	36.1	57 00.7	114	22 35.6	+18
16 16	322 32.9	32 45.6	46.7	104 35.5	09.6	168 41.9	49.6	87 19.6	36.1	71 31.1	115	22 33.8	+20
17 17	337 35.4	47 44.7	46.3	119 36.4	10.2	183 44.3	49.6	102 21.8	36.2	86 01.6	115	-22 31.8	+20
18 18	352 37.8	62 43.8	-23 46.0	134 37.3	-14 10.7	198 46.8	+11 49.6	117 23.9	-17 36.3	100 32.1	116	22 29.8	+22
19 19	7 40.3	77 42.8	45.6	149 38.1	11.2	213 49.2	49.6	132 26.1	36.3	115 02.7	115	22 27.6	+23
20 20	22 42.8	92 41.9	45.2	164 39.0	11.8	228 51.6	49.6	147 28.3	36.4	129 33.2	116	-22 25.3	+23
21 21	37 45.2	107 41.0	44.9	179 39.9	12.3	243 54.1	49.6	162 30.5	36.5	144 03.8	115	22 23.0	+25
22 22	52 47.7	122 40.1	44.5	194 40.8	12.8	258 56.5	49.6	177 32.6	36.5	158 34.3	116	22 20.5	+26
23 23	67 50.2	137 39.2	44.1	209 41.6	13.3	273 59.0	49.6	192 34.8	36.6				
24 24	82 52.6	152 38.3	-23 43.7	224 42.5	-14 13.9	289 01.4	+11 49.6	207 37.0	-17 36.6	173 04.9	117	-22 17.9	+26
code	-	- 9	+ 3	+ 9	- 6	+ 24	0	+ 22	- 1				

G M T		SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS													
		GHA	Dec.	No.	Name	SHA	Dec.				12	13	14	15	Alt.	Sun's Lower Limb	Venus	Mars										
h		°		°				N.	h	m	h	m	h	m	h	m	Alt.	Add	Add	Add								
12	0	181	41.4	-23	00.2	7	Acamar	315	50.6	-40	28.9	72	■	6	45	■	■	■	■	Alt.	Sun's Lower Limb	Venus	Mars					
	1	196	41.1	00.4	5	Achernar	335	58.4	-57	27.7	70	■	6	36	■	■	■	■	Alt.	Sun's Lower Limb	Venus	Mars						
	2	211	40.8	00.6	30	Acruz	173	57.8	-62	51.1	68	■	6	29	9	43	■	12	13	Alt.	Sun's Lower Limb	Venus	Mars					
	3	226	40.5	00.8	19	Adhara	255	46.0	-28	54.6	66	10	22	6	23	8	34	9	55	Alt.	Sun's Lower Limb	Venus	Mars					
	4	241	40.2	01.0	10	Aldebaran	291	38.5	+16	25.4	64	9	42	6	17	7	58	9	08	Alt.	Sun's Lower Limb	Venus	Mars					
	5	256	39.9	01.2	32	Alioth	166	58.6	+56	11.6	62	9	15	6	13	7	32	8	38	Alt.	Sun's Lower Limb	Venus	Mars					
	6	271	39.6	-23	01.4	34	Alkaid	153	33.1	+49	31.7	58	8	37	6	04	6	55	7	57	Alt.	Sun's Lower Limb	Venus	Mars				
	7	286	39.3	01.6	55	Al Na'ir	28	37.9	-47	10.6	56	8	23	6	01	6	42	7	42	8	32	Alt.	Sun's Lower Limb	Venus	Mars			
	8	301	39.1	01.8	15	Alnilam	276	29.8	-1	13.7	54	8	10	5	56	6	29	7	28	8	19	Alt.	Sun's Lower Limb	Venus	Mars			
	9	316	38.8	02.0	25	Alphard	218	38.3	-8	28.1	52	7	59	5	53	6	19	7	17	8	07	Alt.	Sun's Lower Limb	Venus	Mars			
	10	331	38.5	02.2	41	Alphecca	126	47.8	+26	51.6	50	7	50	5	50	6	09	7	07	7	57	Alt.	Sun's Lower Limb	Venus	Mars			
	11	346	38.2	02.4	1	Alpheratz	358	28.1	+28	51.1	45	7	29	5	42	5	50	6	45	7	35	Alt.	Sun's Lower Limb	Venus	Mars			
	12	1	37.9	-23	02.6	51	Altair	62	50.5	+8	45.2	40	7	13	5	35	5	33	6	28	7	18	Alt.	Sun's Lower Limb	Venus	Mars		
	13	16	37.6	02.8	42	Antares	113	19.5	-26	20.1	35	6	59	5	28	5	20	6	13	7	03	Alt.	Sun's Lower Limb	Venus	Mars			
	14	31	37.3	03.0	2	Ankaa	353	58.0	-42	32.8	30	6	47	5	21	5	08	6	01	6	51	Alt.	Sun's Lower Limb	Venus	Mars			
	15	46	37.0	03.2	2	Antares	113	19.5	-26	20.1	20	6	26	5	07	4	48	5	39	6	29	Alt.	Sun's Lower Limb	Venus	Mars			
	16	61	36.7	03.4	37	Arcturus	146	35.3	+19	24.5	10	6	07	4	52	4	31	5	21	6	10	Alt.	Sun's Lower Limb	Venus	Mars			
	17	76	36.4	03.6	43	Atria	109	00.7	-68	56.9	0	5	50	4	35	4	14	5	03	5	52	Alt.	Sun's Lower Limb	Venus	Mars			
	18	91	36.1	-23	03.8	22	Avior	234	35.2	-59	21.9	10	5	33	4	15	3	58	4	46	5	35	Alt.	Sun's Lower Limb	Venus	Mars		
	19	106	35.9	04.0	43	Bellatrix	279	17.9	+6	18.7	20	5	14	3	50	3	41	4	27	5	16	Alt.	Sun's Lower Limb	Venus	Mars			
	20	121	35.6	04.2	16	Betelge'se	271	47.6	+7	24.0	30	4	52	3	16	3	21	4	06	4	54	Alt.	Sun's Lower Limb	Venus	Mars			
	21	136	35.3	04.3	35	Canopus	264	14.7	-52	40.2	35	4	40	2	53	3	10	3	54	4	42	Alt.	Sun's Lower Limb	Venus	Mars			
	22	151	35.0	04.5	40	Capella	281	37.7	+45	57.3	40	4	25	2	23	2	56	3	39	4	27	Alt.	Sun's Lower Limb	Venus	Mars			
	23	166	34.7	04.7	54	Deneb	50	01.2	+45	07.6	45	4	07	1	36	2	41	3	22	4	10	Alt.	Sun's Lower Limb	Venus	Mars			
13	0	181	34.4	-23	04.9	53	Deneb	50	01.2	+45	07.6	52	3	34	///	2	13	2	51	3	38	Alt.	Sun's Lower Limb	Venus	Mars			
	1	196	34.1	05.1	28	Denebola	183	17.6	+14	48.9	52	3	34	///	2	13	2	51	3	38	Alt.	Sun's Lower Limb	Venus	Mars				
	2	211	33.8	05.3	4	Diphda	349	39.0	-18	13.7	54	3	22	///	2	03	2	40	3	26	Alt.	Sun's Lower Limb	Venus	Mars				
	3	226	33.5	05.5	27	Dubhe	194	44.3	+61	58.9	56	3	08	///	1	51	2	27	3	13	Alt.	Sun's Lower Limb	Venus	Mars				
	4	241	33.2	05.7	14	Elnath	279	06.7	+28	34.3	58	2	52	///	1	38	2	13	2	58	Alt.	Sun's Lower Limb	Venus	Mars				
	5	256	32.9	05.8	47	Eltanin	91	06.7	+51	29.7	60	2	32	///	1	23	1	55	2	40	Alt.	Sun's Lower Limb	Venus	Mars				
	6	271	32.6	-23	06.0	54	Enif	34	29.6	+9	40.5	S									Alt.	Sun's Lower Limb	Venus	Mars				
	7	286	32.3	06.2	56	Fomalhaut	16	11.5	-29	51.4	60	2	32	///	1	23	1	55	2	40	Alt.	Sun's Lower Limb	Venus	Mars				
	8	301	32.0	06.4	31	Gacrux	172	49.2	-56	51.8	Lat.	Sunset	Twlt. ends	Moonset				Alt.				Sun's Lower Limb	Venus	Mars				
	9	316	31.8	06.6	29	Gienah	176	36.8	-17	17.8	N.	h	m	h	m	h	m	h	m	h	m	Alt.	Sun's Lower Limb	Venus	Mars			
	10	331	31.5	06.7	35	Hadar	149	49.6	-60	09.5	72	■	17	01	■	■	■	■	■	■	Alt.	Sun's Lower Limb	Venus	Mars				
	11	346	31.2	06.9	6	Hamal	328	49.2	+23	15.5	70	■	17	10	■	■	■	■	■	■	Alt.	Sun's Lower Limb	Venus	Mars				
	12	1	30.9	-23	07.1	48	Kaus Aust.	84	41.4	-34	24.4	68	■	17	17	11	02	■	■	■	13	38	Alt.	Sun's Lower Limb	Venus	Mars		
	13	16	30.6	07.3	40	Kochab	137	19.0	+74	19.9	66	13	26	17	23	12	13	12	34	13	26	Alt.	Sun's Lower Limb	Venus	Mars			
	14	31	30.3	07.5	57	Markab	14	21.3	+14	58.3	64	14	06	17	29	12	49	13	20	14	12	Alt.	Sun's Lower Limb	Venus	Mars			
	15	46	30.0	07.6	8	Menkar	314	59.9	+3	55.2	62	14	33	17	34	13	15	13	50	14	42	Alt.	Sun's Lower Limb	Venus	Mars			
	16	61	29.7	07.8	36	Menkent	148	58.7	-36	09.1	60	14	54	17	39	13	35	14	13	15	04	Alt.	Sun's Lower Limb	Venus	Mars			
	17	76	29.4	08.0	24	Miapl'dus	221	48.4	-69	32.0	58	15	11	17	43	13	52	14	32	15	23	Alt.	Sun's Lower Limb	Venus	Mars			
	18	91	29.1	-23	08.1	9	Mirfak	309	41.7	+49	42.6	56	15	25	17	46	14	06	14	47	15	38	Alt.	Sun's Lower Limb	Venus	Mars		
	19	106	28.8	08.3	50	Nunki	76	52.0	-26	21.2	54	15	37	17	50	14	19	15	00	15	51	Alt.	Sun's Lower Limb	Venus	Mars			
	20	121	28.5	08.5	52	Peacock	54	27.5	-56	52.8	52	15	48	17	53	14	30	15	12	16	03	Alt.	Sun's Lower Limb	Venus	Mars			
	21	136	28.2	08.7	26	Regulus	208	29.2	+12	10.8	50	15	58	17	57	14	39	15	22	16	13	Alt.	Sun's Lower Limb	Venus	Mars			
	22	151	27.9	08.8	11	Rigel	281	53.1	-8	15.1	45	16	19	18	06	15	00	15	44	16	34	Alt.	Sun's Lower Limb	Venus	Mars			
	23	166	27.6	09.0	38	Rigel Kent.	140	51.2	-60	39.2	35	16	49	18	19	15	30	16	16	17	06	Alt.	Sun's Lower Limb	Venus	Mars			
14	0	181	27.3	-23	09.2	44	Sabik	103	02.3	-15	40.3	30	17	22	18	40	16	03	16	50	Alt.	Sun's Lower Limb	Venus	Mars				
	1	196	27.0	09.3	46	R'alhague	96	46.8	+12	35.5	10	17	41	18	56	16	21	17	09	17	59	Alt.	Sun's Lower Limb	Venus	Mars			
	2	211	26.7	09.5	26	Regulus	208	29.2	+12	10.8	0	17	58	19	13	16	38	17	27	18	Alt.	Sun's Lower Limb	Venus	Mars				
	3	226	26.4	09.7	11	Rigel	281	53.1	-8	15.1	10	18	15	19	32	16	55	17	45	18	Alt.	Sun's Lower Limb	Venus	Mars				
	4	241	26.1	09.8	38	Rigel Kent.	140	51.2	-60	39.2	35	18	55	20	31	17	34	18	25	19	Alt.	Sun's Lower Limb	Venus	Mars				
	5	256	25.8	10.0	44	Sabik	103	02.3	-15	40.3	35	19	08	20	54	17	46	18	38	19	Alt.	Sun's Lower Limb	Venus	Mars				
	6	271	25.5	-23	10.2	3	Schedar	350	29.6	+56	18.2	40	19	23	21	25	18	00	18	52	Alt.	Sun's Lower Limb	Venus	Mars				
	7	286	25.2	10.3	45	Shaula	97	20.9	-37	04.4	45	19	41	22	12	18	17	19	10	19	Alt.	Sun's Lower Limb	Venus	Mars				
	8	301	25.0	10.5	18	Sirius	259	11.4	-16	39.3	50	20	03	///	18	37	19	31	20	18	Alt.	Sun's Lower Limb	Venus	Mars				
	9	316	24.7	10.7	33	Spica	159	16.9	-10	55.9	52	20	14	///	18	47	19	41	20	28	Alt.	Sun's Lower Limb	Venus	Mars				
	10	331	24.4	10.8	23	Suhail	223	23.9	-43	15.1	54	20	26	///	18	58	19	53	20	39	Alt.	Sun's Lower Limb	Venus	Mars				
	11	346	24.1	11.0	49	Vega	81	08.6	+38	44.6	56	20	40	///	19	11	20	06	20	52	Alt.	Sun's Lower Limb	Venus	Mars				
	12	1	23.8	-23	11.1	39	Zub'g'bi	137	53.4	-15	51.6	58	20	56	///	19	25	20	22	21	06	Alt.	Sun's Lower Limb	Venus	Mars			
	13	16	23.5	11.3	39	Zub'g'bi	137	53.4	-15	51.6	S											Alt.	Sun's Lower Limb	Venus	Mars			
	14	31	23.2	11.4	Equation of Time (App.—Mean)	GMT of Transit Meridian of Greenwich				DAY				Moon	Venus	Mars	Jupiter	Saturn	Alt.				Sun's Lower Limb	Venus	Mars			
	15	46	22.9	11.6	12	h	m	s	13	h	m	s	14	h	m	s	15	h	m	s	16	h	m	s	Alt.	Sun's Lower Limb	Venus	Mars
	16	61	22.6	11.8	6	h	m	s	7	h	m	s	8	h	m	s	9	h	m	s	10	h	m	s	Alt.	Sun's Lower Limb	Venus	Mars
	17	76	22.3	11.9	6	h	m	s	7	h	m	s	8	h	m	s	9	h	m	s	10	h	m					

G M T	T		VENUS - 3.3		MARS 1.8		JUPITER - 1.8		SATURN 0.7		MOON			
	GHA		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
h	o		o		o		o		o		o		o	
15	0	82 52.6	152 38.3	-23 43.7	224 42.5	-14 13.9	289 01.4	+11 49.6	207 37.0	-17 36.6	173 04.9	117	-22 17.9	+ 26
	1	97 55.1	167 37.4	43.4	239 43.4	14.4	304 03.8	49.6	222 39.2	36.7	187 35.6	116	-22 15.3	+ 28
	2	112 57.6	182 36.5	43.0	254 44.3	14.9	319 06.3	49.6	237 41.4	36.8	202 06.2	117	-22 12.5	+ 29
	3	128 00.0	197 35.6	42.6	269 45.1	15.4	334 08.7	49.6	252 43.5	36.8	216 36.9	117	-22 09.6	+ 30
	4	143 02.5	212 34.7	42.2	284 46.0	16.0	349 11.1	49.6	267 45.7	36.9	231 07.6	117	-22 06.6	+ 31
	5	158 04.9	227 33.8	41.9	299 46.9	16.5	4 13.6	49.6	282 47.9	36.9	245 38.3	118	-22 03.5	+ 32
	6	173 07.4	242 32.9	-23 41.5	314 47.8	-14 17.0	19 16.0	+11 49.6	297 50.1	-17 37.0	260 09.1	117	-22 00.3	+ 33
	7	188 09.9	257 32.0	41.1	329 48.6	17.5	34 18.4	49.6	312 52.2	37.1	274 39.8	118	-21 57.0	+ 34
	8	203 12.3	272 31.1	40.7	344 49.5	18.1	49 20.9	49.6	327 54.4	37.1	289 10.6	118	-21 53.6	+ 34
	9	218 14.8	287 30.2	40.3	359 50.4	18.6	64 23.3	49.7	342 56.6	37.2	303 41.4	119	-21 50.2	+ 36
	10	233 17.3	302 29.3	39.9	14 51.3	19.1	79 25.8	49.7	357 58.8	37.3	318 12.3	119	-21 46.6	+ 37
	11	248 19.7	317 28.4	39.5	29 52.1	19.6	94 28.2	49.7	13 01.0	37.3	332 43.2	119	-21 42.9	+ 38
	12	263 22.2	332 27.5	-23 39.2	44 53.0	-14 20.2	109 30.6	+11 49.7	28 03.1	-17 37.4	347 14.1	119	-21 39.1	+ 39
	13	278 24.7	347 26.6	38.8	59 53.9	20.7	124 33.1	49.7	43 05.3	37.4	1 45.0	120	-21 35.2	+ 40
	14	293 27.1	2 25.7	38.4	74 54.8	21.2	139 35.5	49.7	58 07.5	37.5	16 16.0	120	-21 31.2	+ 41
	15	308 29.6	17 24.8	38.0	89 55.6	21.7	154 38.0	49.7	73 09.7	37.6	30 47.0	120	-21 27.1	+ 42
	16	323 32.1	32 23.9	37.6	104 56.5	22.2	169 40.4	49.7	88 11.9	37.6	45 18.0	120	-21 22.9	+ 43
	17	338 34.5	47 23.0	37.2	119 57.4	22.8	184 42.8	49.7	103 14.0	37.7	59 49.0	121	-21 18.6	+ 43
	18	353 37.0	62 22.1	-23 36.8	134 58.3	-14 23.3	199 45.3	+11 49.7	118 16.2	-17 37.7	74 20.1	121	-21 14.3	+ 45
	19	8 39.4	77 21.2	36.4	149 59.1	23.8	214 47.7	49.7	133 18.4	37.8	88 51.2	122	-21 09.8	+ 46
	20	23 41.9	92 20.3	36.0	165 00.0	24.3	229 50.2	49.7	148 20.6	37.9	103 22.4	122	-21 05.2	+ 47
	21	38 44.4	107 19.4	35.6	180 00.9	24.9	244 52.6	49.7	163 22.8	37.9	117 53.6	122	-21 00.5	+ 47
	22	53 46.8	122 18.5	35.2	195 01.8	25.4	259 55.0	49.7	178 24.9	38.0	132 24.8	122	-20 55.8	+ 49
	23	68 49.3	137 17.6	34.8	210 02.6	25.9	274 57.5	49.7	193 27.1	38.1	146 56.0	123	-20 50.9	+ 49
16	0	83 51.8	152 16.7	-23 34.4	225 03.5	-14 26.4	289 59.9	+11 49.7	208 29.3	-17 38.1	161 27.3	123	-20 46.0	+ 51
	1	98 54.2	167 15.8	34.0	240 04.4	26.9	305 02.4	49.7	223 31.5	38.2	175 58.6	123	-20 40.9	+ 51
	2	113 56.7	182 14.9	33.6	255 05.2	27.5	320 04.8	49.7	238 33.7	38.2	190 29.9	124	-20 35.8	+ 53
	3	128 59.2	197 14.0	33.2	270 06.1	28.0	335 07.3	49.7	253 35.8	38.3	205 01.3	124	-20 30.5	+ 53
	4	144 01.6	212 13.1	32.8	285 07.0	28.5	350 09.7	49.7	268 38.0	38.4	219 32.7	124	-20 25.2	+ 54
	5	159 04.1	227 12.2	32.4	300 07.9	29.0	5 12.1	49.7	283 40.2	38.4	234 04.1	125	-20 19.8	+ 55
	6	174 06.5	242 11.3	-23 31.9	315 08.7	-14 29.5	20 14.6	+11 49.7	298 42.4	-17 38.5	248 35.6	125	-20 14.3	+ 56
	7	189 09.0	257 10.5	31.5	330 09.6	30.1	35 17.0	49.7	313 44.5	38.5	263 07.1	126	-20 08.7	+ 57
	8	204 11.5	272 09.6	31.1	345 10.5	30.6	50 19.5	49.7	328 46.7	38.6	277 38.7	126	-20 03.0	+ 58
	9	219 13.9	287 08.7	30.7	0 11.4	31.1	65 21.9	49.7	343 48.9	38.7	292 10.3	126	-19 57.2	+ 59
	10	234 16.4	302 07.8	30.3	15 12.2	31.6	80 24.4	49.7	358 51.1	38.7	306 41.9	127	-19 51.3	+ 59
	11	249 18.9	317 06.9	29.9	30 13.1	32.2	95 26.8	49.7	13 53.3	38.8	321 13.5	127	-19 45.4	+ 61
	12	264 21.3	332 06.0	-23 29.4	45 14.0	-14 32.7	110 29.3	+11 49.7	28 55.4	-17 38.8	335 45.2	127	-19 39.3	+ 61
	13	279 23.8	347 05.1	29.0	60 14.8	33.2	125 31.7	49.8	43 57.6	38.9	350 16.9	128	-19 33.2	+ 62
	14	294 26.3	2 04.2	28.6	75 15.7	33.7	140 34.2	49.8	58 59.8	39.0	4 48.7	128	-19 27.0	+ 63
	15	309 28.7	17 03.3	28.2	90 16.6	34.2	155 36.6	49.8	74 02.0	39.0	19 20.5	128	-19 20.7	+ 64
	16	324 31.2	32 02.4	27.8	105 17.4	34.7	170 39.1	49.8	89 04.2	39.1	33 52.3	129	-19 14.3	+ 65
	17	339 33.7	47 01.5	27.3	120 18.3	35.3	185 41.5	49.8	104 06.3	39.1	48 24.2	129	-19 07.8	+ 66
	18	354 36.1	62 00.7	-23 26.9	135 19.2	-14 35.8	200 44.0	+11 49.8	119 08.5	-17 39.2	62 56.1	129	-19 01.2	+ 66
	19	9 38.6	76 59.8	26.5	150 20.1	36.3	215 46.4	49.8	134 10.7	39.3	77 28.0	130	-18 54.6	+ 67
	20	24 41.0	91 58.9	26.1	165 20.9	36.8	230 48.9	49.8	149 12.9	39.3	92 00.0	130	-18 47.9	+ 69
	21	39 43.5	106 58.0	25.6	180 21.8	37.3	245 51.3	49.8	164 15.1	39.4	106 32.0	131	-18 41.0	+ 69
	22	54 46.0	121 57.1	25.2	195 22.7	37.9	260 53.8	49.8	179 17.3	39.5	121 04.1	131	-18 34.1	+ 69
	23	69 48.4	136 56.2	24.8	210 23.5	38.4	275 56.2	49.8	194 19.4	39.5	135 36.2	131	-18 27.2	+ 71
17	0	84 50.9	151 55.3	-23 24.3	225 24.4	-14 38.9	290 58.7	+11 49.8	209 21.6	-17 39.6	150 08.3	131	-18 20.1	+ 72
	1	99 53.4	166 54.4	23.9	240 25.3	39.4	306 01.1	49.8	224 23.8	39.6	164 40.4	132	-18 12.9	+ 72
	2	114 55.8	181 53.6	23.5	255 26.1	39.9	321 03.6	49.8	239 26.0	39.7	179 12.6	133	-18 05.7	+ 73
	3	129 58.3	196 52.7	23.0	270 27.0	40.4	336 06.0	49.8	254 28.2	39.8	193 44.9	132	-17 58.4	+ 74
	4	145 00.8	211 51.8	22.6	285 27.9	41.0	351 08.5	49.8	269 30.3	39.8	208 17.1	133	-17 51.0	+ 74
	5	160 03.2	226 50.9	22.1	300 28.7	41.5	6 10.9	49.9	284 32.5	39.9	222 49.4	134	-17 43.6	+ 76
	6	175 05.7	241 50.0	-23 21.7	315 29.6	-14 42.0	21 13.4	+11 49.9	299 34.7	-17 39.9	237 21.8	134	-17 36.0	+ 76
	7	190 08.2	256 49.1	21.3	330 30.5	42.5	36 15.8	49.9	314 36.9	40.0	251 54.2	134	-17 28.4	+ 77
	8	205 10.6	271 48.3	20.8	345 31.4	43.0	51 18.3	49.9	329 39.1	40.1	266 26.6	134	-17 20.7	+ 78
	9	220 13.1	286 47.4	20.4	0 32.2	43.5	66 20.7	49.9	344 41.2	40.1	280 59.0	135	-17 12.9	+ 78
	10	235 15.5	301 46.5	19.9	15 33.1	44.1	81 23.2	49.9	359 43.4	40.2	295 31.5	135	-17 05.1	+ 79
	11	250 18.0	316 45.6	19.5	30 34.0	44.6	96 25.6	49.9	14 45.6	40.2	310 04.0	136	-16 57.2	+ 80
	12	265 20.5	331 44.7	-23 19.0	45 34.8	-14 45.1	111 28.1	+11 49.9	29 47.8	-17 40.3	324 36.6	136	-16 49.2	+ 81
	13	280 22.9	346 43.8	18.6	60 35.7	45.6	126 30.5	49.9	44 50.0	40.4	339 09.2	136	-16 41.1	+ 81
	14	295 25.4	1 43.0	18.1	75 36.6	46.1	141 33.0	49.9	59 52.2	40.4	353 41.8	136	-16 33.0	+ 83
	15	310 27.9	16 42.1	17.7	90 37.4	46.6	156 35.5	49.9	74 54.3	40.5	8 14.4	137	-16 24.7	+ 82
	16	325 30.3	31 41.2	17.2	105 38.3	47.1	171 37.9	49.9	89 56.5	40.5	22 47.1	138	-16 16.5	+ 84
	17	340 32.8	46 40.3	16.8	120 39.2	47.7	186 40.4	50.0	104 58.7	40.6	37 19.9	137	-16 08.1	+ 84
	18	355 35.3	61 39.4	-23 16.3	135 40.0	-14 48.2	201 42.8	+11 50.0	120 0					

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G M T	VENUS -3.4		MARS 1.8		JUPITER -1.9		SATURN 0.7		MOON				
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code	
h	o												
18	0	85 50.0	151 34.2	-23 13.6	225 45.2	-14 51.3	291 57.6	+11 50.0	210 14.0	-17 41.0	139 09.9	139	-15 07.6 + 89
	1	100 52.5	166 33.3	13.1	240 46.1	51.8	307 00.0	50.0	225 16.2	41.1	153 42.8	141	14 58.7 + 90
	2	115 55.0	181 32.4	12.6	255 47.0	52.3	322 02.5	50.0	240 18.3	41.1	168 15.9	140	14 49.7 + 90
	3	130 57.4	196 31.6	12.2	270 47.8	52.8	337 04.9	50.0	255 20.5	41.2	182 48.9	141	14 40.7 + 91
	4	145 59.9	211 30.7	11.7	285 48.7	53.3	352 07.4	50.1	270 22.7	41.3	197 22.0	141	14 31.6 + 92
	5	161 02.4	226 29.8	11.2	300 49.6	53.8	7 09.9	50.1	285 24.9	41.3	211 55.1	141	14 22.4 + 92
	6	176 04.8	241 28.9	-23 10.8	315 50.4	-14 54.3	22 12.3	+11 50.1	300 27.1	-17 41.4	226 28.2	142	-14 13.2 + 93
	7	191 07.3	256 28.1	10.3	330 51.3	54.8	37 14.8	50.1	315 29.2	41.4	241 01.4	142	14 03.9 + 94
	8	206 09.8	271 27.2	09.8	345 52.1	55.4	52 17.2	50.1	330 31.4	41.5	255 34.6	142	13 54.5 + 94
	9	221 12.2	286 26.3	09.3	0 53.0	55.9	67 19.7	50.1	345 33.6	41.6	270 07.8	143	13 45.1 + 95
	10	236 14.7	301 25.4	08.9	15 53.9	56.4	82 22.2	50.1	0 35.8	41.6	284 41.1	142	13 35.6 + 95
	11	251 17.1	316 24.6	08.4	30 54.7	56.9	97 24.6	50.1	15 38.0	41.7	299 14.3	144	13 26.1 + 96
	12	266 19.6	331 23.7	-23 07.9	45 55.6	-14 57.4	112 27.1	+11 50.1	30 40.2	-17 41.7	313 47.7	143	-13 16.5 + 97
	13	281 22.1	346 22.8	07.4	60 56.5	57.9	127 29.6	50.2	45 42.3	41.8	328 21.0	143	13 06.8 + 97
	14	296 24.5	1 22.0	07.0	75 57.3	58.4	142 32.0	50.2	60 44.5	41.9	342 54.3	144	12 57.1 + 98
	15	311 27.0	16 21.1	06.5	90 58.2	58.9	157 34.5	50.2	75 46.7	41.9	357 27.7	144	12 47.3 + 98
	16	326 29.5	31 20.2	06.0	105 59.1	59.4	172 36.9	50.2	90 48.9	42.0	12 01.1	145	12 37.5 + 99
	17	341 31.9	46 19.3	05.5	120 59.9	14 59.9	187 39.4	50.2	105 51.1	42.0	26 34.6	144	12 27.6 + 100
	18	356 34.4	61 18.5	-23 05.0	136 00.8	-15 00.5	202 41.9	+11 50.2	120 53.3	-17 42.1	41 08.0	145	-12 17.6 + 100
	19	11 36.9	76 17.6	04.5	151 01.7	01.0	217 44.3	50.2	135 55.4	42.2	55 41.5	145	12 07.6 + 100
	20	26 39.3	91 16.7	04.1	166 02.5	01.5	232 46.8	50.2	150 57.6	42.2	70 15.0	145	11 57.6 + 101
	21	41 41.8	106 15.9	03.6	181 03.4	02.0	247 49.3	50.2	165 59.8	42.3	84 48.5	146	11 47.5 + 102
	22	56 44.3	121 15.0	03.1	196 04.2	02.5	262 51.7	50.3	181 02.0	42.3	99 22.1	145	11 37.3 + 102
	23	71 46.7	136 14.1	02.6	211 05.1	03.0	277 54.2	50.3	196 04.2	42.4	113 55.6	146	11 27.1 + 103
19	0	86 49.2	151 13.3	-23 02.1	226 06.0	-15 03.5	292 56.7	+11 50.3	211 06.4	-17 42.5	128 29.2	146	-11 16.8 + 103
	1	101 51.6	166 12.4	01.6	241 06.8	04.0	307 59.1	50.3	226 08.5	42.5	143 02.8	146	11 06.5 + 104
	2	116 54.1	181 11.5	01.1	256 07.7	04.5	323 01.6	50.3	241 10.7	42.6	157 36.4	147	10 56.1 + 104
	3	131 56.6	196 10.7	00.6	271 08.6	05.0	338 04.1	50.3	256 12.9	42.6	172 10.1	146	10 45.7 + 105
	4	146 59.0	211 09.8	23 00.1	286 09.4	05.5	353 06.5	50.3	271 15.1	42.7	186 43.7	147	10 35.2 + 105
	5	162 01.5	226 08.9	22 59.6	301 10.3	06.1	8 09.0	50.3	286 17.3	42.7	201 17.4	147	10 24.7 + 106
	6	177 04.0	241 08.1	-22 59.1	316 11.1	-15 06.6	23 11.5	+11 50.4	301 19.5	-17 42.8	215 51.1	147	-10 14.1 + 106
	7	192 06.4	256 07.2	58.6	331 12.0	07.1	38 13.9	50.4	316 21.6	42.9	230 24.8	147	10 03.5 + 107
	8	207 08.9	271 06.4	58.1	346 12.9	07.6	53 16.4	50.4	331 23.8	42.9	244 58.5	148	9 52.8 + 107
	9	222 11.4	286 05.5	57.6	1 13.7	08.1	68 18.9	50.4	346 26.0	43.0	259 32.3	147	9 42.1 + 108
	10	237 13.8	301 04.6	57.1	16 14.6	08.6	83 21.4	50.4	1 28.2	43.0	274 06.0	148	9 31.3 + 108
	11	252 16.3	316 03.8	56.6	31 15.4	09.1	98 23.8	50.4	16 30.4	43.1	288 39.8	148	9 20.5 + 108
	12	267 18.8	331 02.9	-22 56.1	46 16.3	-15 09.6	113 26.3	+11 50.4	31 32.6	-17 43.2	303 13.6	147	9 09.7 + 109
	13	282 21.2	346 02.1	55.6	61 17.2	10.1	128 28.8	50.5	46 34.8	43.2	317 47.3	148	8 58.8 + 110
	14	297 23.7	1 01.2	55.1	76 18.0	10.6	143 31.2	50.5	61 36.9	43.3	332 21.1	149	8 47.8 + 110
	15	312 26.1	16 00.3	54.6	91 18.9	11.1	158 33.7	50.5	76 39.1	43.3	346 55.0	148	8 36.8 + 110
	16	327 28.6	30 59.5	54.1	106 19.8	11.6	173 36.2	50.5	91 41.3	43.4	1 28.8	148	8 25.8 + 111
	17	342 31.1	45 58.6	53.6	121 20.6	12.1	188 38.6	50.5	106 43.5	43.5	16 02.6	148	8 14.7 + 111
	18	357 33.5	60 57.8	-22 53.1	136 21.5	-15 12.6	203 41.1	+11 50.5	121 45.7	-17 43.5	30 36.4	149	8 03.6 + 111
	19	12 36.0	75 56.9	52.5	151 22.3	13.1	218 43.6	50.5	136 47.9	43.6	45 10.3	148	7 52.5 + 112
	20	27 38.5	90 56.0	52.0	166 23.2	13.7	233 46.1	50.6	151 50.0	43.6	59 44.1	149	7 41.3 + 112
	21	42 40.9	105 55.2	51.5	181 24.1	14.2	248 48.5	50.6	166 52.2	43.7	74 18.0	148	7 30.1 + 113
	22	57 43.4	120 54.3	51.0	196 24.9	14.7	263 51.0	50.6	181 54.4	43.8	88 51.8	149	7 18.8 + 113
	23	72 45.9	135 53.5	50.5	211 25.8	15.2	278 53.5	50.6	196 56.6	43.8	103 25.7	148	7 07.5 + 114
20	0	87 48.3	150 52.6	-22 50.0	226 26.6	-15 15.7	293 56.0	+11 50.6	211 58.8	-17 43.9	117 59.5	149	6 56.1 + 113
	1	102 50.8	165 51.8	49.4	241 27.5	16.2	308 58.4	50.6	227 01.0	43.9	132 33.4	149	6 44.8 + 115
	2	117 53.3	180 50.9	48.9	256 28.3	16.7	324 00.9	50.6	242 03.2	44.0	147 07.3	148	6 33.3 + 114
	3	132 55.7	195 50.1	48.4	271 29.2	17.2	339 03.4	50.7	257 05.3	44.0	161 41.1	149	6 21.9 + 115
	4	147 58.2	210 49.2	47.9	286 30.1	17.7	354 05.9	50.7	272 07.5	44.1	176 15.0	149	6 10.4 + 115
	5	163 00.6	225 48.4	47.3	301 30.9	18.2	9 08.3	50.7	287 09.7	44.2	190 48.9	148	5 58.9 + 116
	6	178 03.1	240 47.5	-22 46.8	316 31.8	-15 18.7	24 10.8	+11 50.7	302 11.9	-17 44.2	205 22.7	149	5 47.3 + 116
	7	193 05.6	255 46.7	46.3	331 32.6	19.2	39 13.3	50.7	317 14.1	44.3	219 56.6	148	5 35.7 + 116
	8	208 08.0	270 45.8	45.8	346 33.5	19.7	54 15.8	50.7	332 16.3	44.3	234 30.4	149	5 24.1 + 116
	9	223 10.5	285 44.9	45.2	1 34.4	20.2	69 18.2	50.8	347 18.5	44.4	249 04.3	148	5 12.5 + 117
	10	238 13.0	300 44.1	44.7	16 35.2	20.7	84 20.7	50.8	2 20.6	44.5	263 38.1	149	5 00.8 + 117
	11	253 15.4	315 43.2	44.2	31 36.1	21.2	99 23.2	50.8	17 22.8	44.5	278 12.0	148	4 49.1 + 118
	12	268 17.9	330 42.4	-22 43.6	46 36.9	-15 21.7	114 25.7	+11 50.8	32 25.0	-17 44.6	292 45.8	148	4 37.3 + 117
	13	283 20.4	345 41.6	43.1	61 37.8	22.2	129 28.2	50.8	47 27.2	44.6	307 19.6	148	4 25.6 + 118
	14	298 22.8	0 40.7	42.6	76 38.6	22.7	144 30.6	50.8	62 29.4	44.7	321 53.4	148	4 13.8 + 119
	15	313 25.3	15 39.9	42.0	91 39.5	23.2	159 33.1	50.9	77 31.6	44.7	336 27.2	148	4 01.9 + 118
	16	328 27.7	30 39.0	41.5	106 40.4	23.7	174 35.6	50.9	92 33.8	44.8	351 01.0	148	3 50.1 + 119
	17	343 30.2	45 38.2	40.9	121 41.2	24.2	189 38.1	50.9	107 35.9	44.9	5 34.8	148	3 38.2 + 119
	18	358 32.7	60 37.3	-22 40.4	136 42.1	-15 24.7	204 40.6	+11 50.9	122 38.1	-17 44.9	20 08.6	147	3 26.3 + 120
	19	13 35.1	75 36.5	39.9	151 42.9	25.2	219 43.0	50.9	137 40.3	45.0	34 42.3	148	3 14.3 + 119
	20	28 37.6	90 35.6	39.3	166 43.8	25.7	234 45.5	50.9	152 42.5	45.0	49 16.1	147	3 02.4 + 120
	21	43 40.1	105 34.8	38.8	181 44.6	26.2	249 48.0	51.0	167 44.7	45.1	63 49.8	147	2 50.4 + 120
	22	58 42.5	120 33.9	38.2	196 45.5	26.7	264 50.5	51.0					

G M T	SUN			STARS			Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS								
	GHA	Dec.	No.	Name	SHA	Dec.				N	h	m	h	m	h	m	h	m	Alt.	Sun's Low'r Limb Add	Venus Add	Mars Add
18	0	180 58.3	-23 21.6	7	Acamar	315 50.6	-40 28.9	72	6 52	12 13	11 48	11 28	11 11	Alt.								
	1	195 58.0	21.7	5	Achernar	335 58.4	-57 27.8	70	6 43	11 48	11 34	11 22	11 11									
	2	210 57.7	21.8	30	Acrux	173 57.7	-62 51.1	68	6 35	11 29	11 22	11 17	11 11									
	3	225 57.4	21.9	19	Adhara	255 46.0	-28 54.7	66	6 29	11 14	11 13	11 12	11 11									
	4	240 57.1	22.0	10	Aldebaran	291 38.5	+16 25.4	64	6 23	11 01	11 05	11 08	11 11									
	5	255 56.8	22.0					62	6 18	10 51	10 58	11 05	11 11		0	0.6	0.1	0.1				
	6	270 56.5	-23 22.1	32	Alioth	166 58.6	+56 11.6	60	6 13	10 42	10 52	11 02	11 10		30	0.6	0.1	0.1				
	7	285 56.2	22.2	34	Alkaid	153 33.0	+49 31.7	58	6 09	10 34	10 47	10 59	11 11		45	0.6	0.1	0.0				
	8	300 55.9	22.3	55	Al Na'ir	28 37.9	-47 10.6	56	6 05	10 26	10 42	10 57	11 10		75	0.6	0.0	0.0				
	9	315 55.6	22.4	15	Alnilam	276 29.7	-1 13.7	54	6 02	10 20	10 38	10 55	11 10		90	0.6	0.0	0.0				
	10	330 55.3	22.5	25	Alphard	218 38.2	-8 28.1	52	5 58	10 14	10 34	10 53	11 10									
	11	345 54.9	22.6					50	5 54	10 09	10 31	10 51	11 10									
	12	0 54.6	-23 22.6	41	Alphecca	126 47.8	+26 51.6	45	5 46	9 58	10 23	10 47	11 10									
	13	15 54.3	22.7	1	Alpheratz	358 28.1	+28 51.1	40	5 38	9 48	10 17	10 44	11 10									
	14	30 54.0	22.8	51	Altair	62 50.5	+8 45.2	35	5 31	9 40	10 11	10 41	11 10									
	15	45 53.7	22.9	2	Ankaa	353 58.0	-42 32.8	30	5 24	9 33	10 06	10 38	11 10									
	16	60 53.4	22.9	42	Antares	113 19.5	-26 20.1	20	5 10	9 21	9 58	10 34	11 10									
	17	75 53.1	23.0					10	4 55	9 10	9 51	10 30	11 10									
	18	90 52.8	-23 23.1	37	Arcturus	146 35.2	+19 24.5	0	4 38	9 00	9 44	10 27	11 10									
	19	105 52.5	23.2	43	Atria	109 00.6	-68 56.9	10	4 17	8 50	9 36	10 23	11 10									
	20	120 52.2	23.3	22	Avior	234 35.2	-59 21.9	20	3 52	8 39	9 29	10 19	11 10									
	21	135 51.9	23.3	13	Bellatrix	279 17.9	+6 18.7	30	3 17	8 26	9 20	10 15	11 10									
	22	150 51.6	23.4	16	Betelge	271 47.6	+7 24.0	35	2 54	8 19	9 15	10 12	11 10									
	23	165 51.3	23.5					40	2 23	8 11	9 10	10 10	11 10									
				17	Canopus	264 14.7	-52 40.3	45	1 35	8 01	9 03	10 06	11 10									
				12	Capella	281 37.7	+45 57.4	50	1 11	7 49	8 55	10 02	11 11									
				53	Deneb	50 01.2	+45 07.6	52	1 00	7 44	8 52	10 00	11 11									
				28	Denebola	183 17.5	+14 48.9	54	1 00	7 38	8 47	9 58	11 11									
				4	Diphda	349 39.0	-18 13.7	56	1 00	7 31	8 43	9 56	11 11									
								58	1 00	7 23	8 38	9 54	11 11									
				27	Dubhe	194 44.2	+61 58.9	60	1 00	7 15	8 32	9 51	11 11									
				14	Elnath	279 06.7	+28 34.3	S														
				47	Eltanin	91 06.7	+51 29.7															
				54	Enif	34 29.6	+9 40.5															
				56	Fomalhaut	16 11.5	-29 51.4															
				31	Gacrux	172 49.1	-56 51.8	72	17 00	18 27	20 23	22 13	24 04									
				29	Gienah	176 36.7	-17 17.9	70	17 09	18 50	20 35	22 17	24 01									
				35	Hadar	149 49.5	-60 09.5	68	17 16	19 08	20 45	22 20	23 58									
				6	Hamal	328 49.2	+23 15.5	66	17 23	19 22	20 52	22 23	23 55									
				48	Kaus Aust.	84 41.3	-34 24.4	64	17 29	19 34	20 59	22 25	23 53									
								62	17 35	19 43	21 05	22 27	23 51									
				40	Kochab	137 18.9	+74 19.9	60	17 39	19 52	21 10	22 29	23 50									
				57	Markab	14 21.3	+14 58.3	58	17 44	19 59	21 14	22 30	23 48									
				8	Menkar	314 59.9	+3 55.2	56	17 47	20 05	21 18	22 32	23 47									
				36	Menkent	148 58.7	-36 09.2	54	17 51	20 11	21 21	22 33	23 46									
				24	Miapl'dus	221 48.4	-69 32.0	52	17 55	20 16	21 24	22 34	23 45									
								50	17 59	20 21	21 27	22 35	23 44									
				9	Mirfak	309 41.7	+49 42.6	45	18 07	20 31	21 33	22 37	23 42									
				50	Nunki	76 52.0	-26 21.2	40	18 15	20 39	21 38	22 39	23 40									
				52	Peacock	54 27.5	-56 52.8	35	18 22	20 46	21 43	22 40	23 39									
				21	Pollux	244 20.0	+28 07.9	30	18 29	20 52	21 47	22 41	23 37									
				20	Procyon	245 44.5	+5 20.3	20	18 44	21 03	21 53	22 44	23 35									
								10	18 58	21 12	21 59	22 46	23 33									
				46	R'alhague	96 46.8	+12 35.5	0	19 16	21 21	22 04	22 47	23 31									
				26	Regulus	208 29.2	+12 10.8	10	19 36	21 30	22 10	22 49	23 29									
				11	Rigel	281 53.1	-8 15.1	20	19 37	20 01	21 39	22 15	22 51									
				38	Rigel Kent.	140 51.2	-60 39.2	30	19 59	20 36	21 49	22 22	22 53									
				44	Sabik	103 02.3	-15 40.3	35	19 59	20 59	21 55	22 25	22 54									
								40	20 02	21 30	22 02	22 29	22 56									
				3	Schedar	350 29.6	+56 18.2	45	20 08	22 18	22 10	22 34	22 57									
				45	Shaula	97 20.9	-37 04.4	50	20 19	22 19	22 40	22 59	23 19									
				18	Sirius	259 11.3	-16 39.3	52	20 31	22 23	22 42	23 00	23 18									
				33	Spica	159 16.8	-10 55.9	54	20 31	22 28	22 45	23 01	23 17									
				23	Suhail	223 23.9	-43 15.2	56	20 45	22 33	22 48	23 02	23 15									
								58	21 02	22 39	22 52	23 03	23 14									
				49	Vega	81 08.6	+38 44.6	60	21 22	22 46	22 55	23 04	23 13									
				39	Zub'g'hi	137 53.4	-15 51.6	S														

G M T	T	VENUS - 3.4		MARS 1.8		JUPITER - 1.9		SATURN 0.8		MOON			
		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
21	0	88 47.5	150 32.2	-22 37.1	226 47.2	-15 27.7	294 55.4	+11 51.0	212 51.2	-17 45.3	107 30.9	146 -	2 14.3 +120
	1	103 49.9	165 31.4	36.6	241 48.1	28.2	309 57.9	51.0	227 53.4	45.3	122 04.5	146	2 02.3 +121
	2	118 52.4	180 30.6	36.0	256 48.9	28.7	325 00.4	51.1	242 55.6	45.4	136 38.1	146	1 50.2 +121
	3	133 54.9	195 29.7	.. 35.5	271 49.8	.. 29.2	340 02.9	.. 51.1	257 57.8	.. 45.4	151 11.7	146	1 38.1 +122
	4	148 57.3	210 28.9	34.9	286 50.6	29.7	355 05.4	51.1	273 00.0	45.5	165 45.3	146	1 25.9 +121
	5	163 59.8	225 28.0	34.4	301 51.5	30.2	10 07.9	51.1	288 02.2	45.6	180 18.9	145	1 13.8 +122
	6	179 02.2	240 27.2	-22 33.8	316 52.3	-15 30.7	25 10.3	+11 51.1	303 04.4	-17 45.6	194 52.4	145	- 1 01.6 +121
	7	194 04.7	255 26.4	33.3	331 53.2	31.2	40 12.8	51.2	318 06.6	45.7	209 25.9	145	0 49.5 +122
	8	209 07.2	270 25.5	32.7	346 54.1	31.7	55 15.3	51.2	333 08.7	45.7	223 59.4	145	0 37.3 +122
	9	224 09.6	285 24.7	.. 32.2	1 54.9	.. 32.2	70 17.8	.. 51.2	348 10.9	.. 45.8	238 32.9	144	0 25.1 +123
	10	239 12.1	300 23.8	31.6	16 55.8	32.7	85 20.3	51.2	3 13.1	45.8	253 06.3	144	0 12.8 +122
	11	254 14.6	315 23.0	31.0	31 56.6	33.2	100 22.8	51.2	18 15.3	45.9	267 39.7	144	- 0 00.6 +123
	12	269 17.0	330 22.2	-22 30.5	46 57.5	-15 33.7	115 25.3	+11 51.2	33 17.5	-17 46.0	282 13.1	143	+ 0 11.7 +122
	13	284 19.5	345 21.3	29.9	61 58.3	34.2	130 27.7	51.3	48 19.7	46.0	296 46.4	143	0 23.9 +123
	14	299 22.0	0 20.5	29.3	76 59.2	34.7	145 30.2	51.3	63 21.9	46.1	311 19.7	143	0 36.2 +123
	15	314 24.4	15 19.7	.. 28.8	92 00.0	.. 35.2	160 32.7	.. 51.3	78 24.1	.. 46.1	325 53.0	142	0 48.5 +123
	16	329 26.9	30 18.8	28.2	107 00.9	35.7	175 35.2	51.3	93 26.2	46.2	340 26.2	142	1 00.8 +123
	17	344 29.4	45 18.0	27.6	122 01.7	36.2	190 37.7	51.3	108 28.4	46.2	354 59.4	142	1 13.1 +123
	18	359 31.8	60 17.1	-22 27.1	137 02.6	-15 36.7	205 40.2	+11 51.4	123 30.6	-17 46.3	9 32.6	141	+ 1 25.4 +123
	19	14 34.3	75 16.3	26.5	152 03.4	37.2	220 42.7	51.4	138 32.8	46.4	24 05.7	141	1 37.7 +123
	20	29 36.7	90 15.5	25.9	167 04.3	37.7	235 45.1	51.4	153 35.0	46.4	38 38.8	140	1 50.0 +124
	21	44 39.2	105 14.6	.. 25.4	182 05.2	.. 38.2	250 47.6	.. 51.4	168 37.2	.. 46.5	53 11.8	140	2 02.4 +123
	22	59 41.7	120 13.8	24.8	197 06.0	38.7	265 50.1	51.5	183 39.4	46.5	67 44.8	140	2 14.7 +124
	23	74 44.1	135 13.0	24.2	212 06.9	39.2	280 52.6	51.5	198 41.6	46.6	82 17.8	139	2 27.1 +123
22	0	89 46.6	150 12.2	-22 23.6	227 07.7	-15 39.7	295 55.1	+11 51.5	213 43.8	-17 46.7	96 50.7	139	+ 2 39.4 +123
	1	104 49.1	165 11.3	23.1	242 08.6	40.2	310 57.6	51.5	228 45.9	46.7	111 23.6	138	2 51.7 +124
	2	119 51.5	180 10.5	22.5	257 09.4	40.6	326 00.1	51.5	243 48.1	46.8	125 56.4	138	3 04.1 +124
	3	134 54.0	195 09.7	.. 21.9	272 10.3	.. 41.1	341 02.6	.. 51.6	258 50.3	.. 46.8	140 29.2	138	3 16.5 +123
	4	149 56.5	210 08.8	21.3	287 11.1	41.6	356 05.1	51.6	273 52.5	46.9	155 02.0	136	3 28.8 +124
	5	164 58.9	225 08.0	20.8	302 12.0	42.1	11 07.6	51.6	288 54.7	46.9	169 34.6	137	3 41.2 +123
	6	180 01.4	240 07.2	-22 20.2	317 12.8	-15 42.6	26 10.0	+11 51.6	303 56.9	-17 47.0	184 07.3	136	+ 3 53.5 +123
	7	195 03.9	255 06.3	19.6	332 13.7	43.1	41 12.5	51.6	318 59.1	47.1	198 39.9	135	4 05.8 +124
	8	210 06.3	270 05.5	19.0	347 14.5	43.6	56 15.0	51.7	334 01.3	47.1	213 12.4	135	4 18.2 +123
	9	225 08.8	285 04.7	.. 18.4	2 15.4	.. 44.1	71 17.5	.. 51.7	349 03.4	.. 47.2	227 44.9	134	4 30.5 +124
	10	240 11.2	300 03.9	17.8	17 16.2	44.6	86 20.0	51.7	4 05.6	47.2	242 17.3	134	4 42.9 +123
	11	255 13.7	315 03.0	17.2	32 17.1	45.1	101 22.5	51.7	19 07.8	47.3	256 49.7	133	4 55.2 +123
	12	270 16.2	330 02.2	-22 16.7	47 17.9	-15 45.6	116 25.0	+11 51.8	34 10.0	-17 47.3	271 22.0	133	+ 5 07.5 +123
	13	285 18.6	345 01.4	16.1	62 18.8	46.1	131 27.5	51.8	49 12.2	47.4	285 54.3	132	5 19.8 +123
	14	300 21.1	0 00.6	15.5	77 19.6	46.6	146 30.0	51.8	64 14.4	47.5	300 26.5	131	5 32.1 +123
	15	315 23.6	14 59.7	.. 14.9	92 20.5	.. 47.1	161 32.5	.. 51.8	79 16.6	.. 47.5	314 58.6	131	5 44.4 +123
	16	330 26.0	29 58.9	14.3	107 21.3	47.6	176 35.0	51.9	94 18.8	47.6	329 30.7	130	5 56.7 +123
	17	345 28.5	44 58.1	13.7	122 22.2	48.0	191 37.5	51.9	109 21.0	47.6	344 02.7	130	6 09.0 +122
	18	0 31.0	59 57.3	-22 13.1	137 23.0	-15 48.5	206 40.0	+11 51.9	124 23.1	-17 47.7	358 34.7	129	+ 6 21.2 +123
	19	15 33.4	74 56.4	12.5	152 23.9	49.0	221 42.5	51.9	139 25.3	47.7	13 06.6	128	6 33.5 +122
	20	30 35.9	89 55.6	11.9	167 24.7	49.5	236 45.0	51.9	154 27.5	47.8	27 38.4	127	6 45.7 +122
	21	45 38.3	104 54.8	.. 11.3	182 25.6	.. 50.0	251 47.5	.. 52.0	169 29.7	.. 47.9	42 10.1	127	6 57.9 +122
	22	60 40.8	119 54.0	10.7	197 26.4	50.5	266 50.0	52.0	184 31.9	47.9	56 41.8	127	7 10.1 +122
	23	75 43.3	134 53.2	10.1	212 27.3	51.0	281 52.5	52.0	199 34.1	48.0	71 13.5	125	7 22.3 +121
23	0	90 45.7	149 52.3	-22 09.5	227 28.1	-15 51.5	296 55.0	+11 52.0	214 36.3	-17 48.0	85 45.0	125	+ 7 34.4 +122
	1	105 48.2	164 51.5	08.9	242 29.0	52.0	311 57.5	52.1	229 38.5	48.1	100 16.5	124	7 46.6 +121
	2	120 50.7	179 50.7	08.3	257 29.8	52.5	326 59.9	52.1	244 40.7	48.1	114 47.9	124	7 58.7 +121
	3	135 53.1	194 49.9	.. 07.7	272 30.7	.. 53.0	342 02.4	.. 52.1	259 42.9	.. 48.2	129 19.3	123	8 10.8 +120
	4	150 55.6	209 49.1	07.1	287 31.5	53.4	357 04.9	52.1	274 45.0	48.2	143 50.6	121	8 22.8 +121
	5	165 58.1	224 48.3	06.5	302 32.4	53.9	12 07.4	52.2	289 47.2	48.3	158 21.7	122	8 34.9 +120
	6	181 00.5	239 47.4	-22 05.9	317 33.2	-15 54.4	27 09.9	+11 52.2	304 49.4	-17 48.4	172 52.9	120	+ 8 46.9 +120
	7	196 03.0	254 46.6	05.2	332 34.1	54.9	42 12.4	52.2	319 51.6	48.4	187 23.9	120	8 58.9 +119
	8	211 05.5	269 45.8	04.6	347 34.9	55.4	57 14.9	52.2	334 53.8	48.5	201 54.9	119	9 10.8 +120
	9	226 07.9	284 45.0	.. 04.0	2 35.8	.. 55.9	72 17.4	.. 52.3	349 56.0	.. 48.5	216 25.8	118	9 22.8 +119
	10	241 10.4	299 44.2	03.4	17 36.6	56.4	87 19.9	52.3	4 58.2	48.6	230 55.6	117	9 34.7 +119
	11	256 12.8	314 43.4	02.8	32 37.4	56.9	102 22.4	52.3	20 00.4	48.6	245 27.3	117	9 46.6 +118
	12	271 15.3	329 42.5	-22 02.2	47 38.3	-15 57.4	117 24.9	+11 52.3	35 02.6	-17 48.7	259 58.0	115	+ 9 58.4 +118
	13	286 17.8	344 41.7	01.6	62 39.1	57.8	132 27.5	52.4	50 04.8	48.8	274 28.5	115	10 10.2 +118
	14	301 20.2	359 40.9	00.9	77 40.0	58.3	147 30.0	52.4	65 07.0	48.8	288 59.0	114	10 22.0 +117
	15	316 22.7	14 40.1	-22 00.3	92 40.8	.. 58.8	162 32.5	.. 52.4	80 09.1	.. 48.9	303 29.4	113	10 33.7 +117
	16	331 25.2	29 39.3	21 59.7	107 41.7	59.3	177 35.0	52.4	95 11.3	48.9	317 59.7	112	10 45.4 +117
	17	346 27.6	44 38.5	59.1	122 42.5	15 59.8	192 37.5	52.5	110 13.5	49.0	332 29.9	112	10 57.1 +116
	18	1 30.1	59 37.7	-21 58.5	137 43.4	-16 00.3	207 40.0	+11 52.5	125 15.7	-17 49.0	347 00.1	110	+11 08.7 +116
	19	16 32.6	74 36.9	57.8	152 44.2	00.8	222 42.5	52.5	140 17.9	49.1	1 30.1	110	11 20.3 +115
	20	31 35.0	89 36.1	57.2	167 45.1	01.3	237 45.0	52.5	155 20.1	49.2	16 00.1	108	11 31.8 +115
	21	46 37.5	104 35.3	.. 56.6	182 45.9	.. 01.7	252 47.5	.. 52.6	170 22.3	.. 49.2	30 29.9	108	11 43.3 +114
	22	61 40.0	119 34.4	56.0	197 46.8	02.2	267 50.0	52.6	185 24.5	49.3	44 59.7	107	11 54.7 +114
	23	76 42.4	134 33.6	55.3	212 47.6	02.7	282 52.5	52.6	200 26.7	49.3	59 29.4	106	12 06.1 +114
24	0	91 44.9	149 32.8	-21 54.7	227 48.5	-16 03.2	297 55.0	+11 52.7	215 28.9	-17 49.4	73 59.0	105	+12 17.5 +113
code		-	- 8	+ 6	+ 9	- 5	+ 25	0	+ 22	- 1			

G M T	VENUS -3.4		MARS 1.8		JUPITER -1.9		SATURN 0.8		MOON				
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code	
24	h	o	o	o	o	o	o	o	o	o	o	o	
0	91 44.9	149 32.8	-21 54.7	227 48.5	-16 03.2	297 55.0	+11 52.7	215 28.9	-17 49.4	73 59.0	105 +12 17.5	+113	
1	106 47.3	164 32.0	54.1	242 49.3	03.7	312 57.5	52.7	230 31.1	49.4	88 28.5	104 12 28.8	+112	
2	121 49.8	179 31.2	53.4	257 50.1	04.2	328 00.0	52.7	245 33.3	49.5	102 57.9	103 12 40.0	+112	
3	136 52.3	194 30.4	.. 52.8	272 51.0	.. 04.7	343 02.5	.. 52.7	260 35.4	.. 49.5	117 27.2	102 -12 51.2	+112	
4	151 54.7	209 29.6	52.2	287 51.8	05.1	358 05.0	52.8	275 37.6	49.6	131 56.4	101 13 02.4	+111	
5	166 57.2	224 28.8	51.5	302 52.7	05.6	13 07.5	52.8	290 39.8	49.7	146 25.5	100 13 13.5	+110	
6	181 59.7	239 28.0	-21 50.9	317 53.5	-16 06.1	28 10.0	+11 52.8	305 42.0	-17 49.7	160 54.5	99 +13 24.5	+110	
7	197 02.1	254 27.2	50.3	332 54.4	06.6	43 12.5	52.8	320 44.2	49.8	175 23.4	98 13 35.5	+109	
8	212 04.6	269 26.4	49.6	347 55.2	07.1	58 15.0	52.9	335 46.4	49.8	189 52.2	98 13 46.4	+108	
9	227 07.1	284 25.6	.. 49.0	2 56.1	.. 07.6	73 17.6	.. 52.9	350 48.6	.. 49.9	204 21.0	96 -13 57.2	+108	
10	242 09.5	299 24.8	48.3	17 56.9	08.0	88 20.1	52.9	5 50.8	49.9	218 49.6	95 14 08.0	+107	
11	257 12.0	314 24.0	47.7	32 57.7	08.5	103 22.6	53.0	20 53.0	50.0	233 18.1	94 14 18.7	+107	
12	272 14.5	329 23.2	-21 47.1	47 58.6	-16 09.0	118 25.1	+11 53.0	35 55.2	-17 50.0	247 46.5	93 +14 29.4	+106	
13	287 16.9	344 22.4	46.4	62 59.4	09.5	133 27.6	53.0	50 57.4	50.1	262 14.8	92 14 40.0	+105	
14	302 19.4	359 21.6	45.8	78 00.3	10.0	148 30.1	53.0	65 59.6	50.2	276 43.0	91 14 50.5	+105	
15	317 21.8	14 20.8	.. 45.1	93 01.1	.. 10.5	163 32.6	.. 53.1	81 01.8	.. 50.2	291 11.1	90 -15 01.0	+104	
16	332 24.3	29 20.0	44.5	108 02.0	10.9	178 35.1	53.1	96 03.9	50.3	305 39.1	89 15 11.4	+103	
17	347 26.8	44 19.2	43.8	123 02.8	11.4	193 37.6	53.1	111 06.1	50.3	320 07.0	88 15 21.7	+102	
18	2 29.2	59 18.4	-21 43.2	138 03.6	-16 11.9	208 40.1	+11 53.2	126 08.3	-17 50.4	334 34.8	86 +15 31.9	+102	
19	17 31.7	74 17.6	42.5	153 04.5	12.4	223 42.7	53.2	141 10.5	50.4	349 02.4	86 15 42.1	+101	
20	32 34.2	89 16.8	41.9	168 05.3	12.9	238 45.2	53.2	156 12.7	50.5	3 30.0	85 15 52.2	+100	
21	47 36.6	104 16.0	.. 41.2	183 06.2	.. 13.4	253 47.7	.. 53.2	171 14.9	.. 50.5	17 57.5	83 -16 02.2	+ 99	
22	62 39.1	119 15.2	40.6	198 07.0	13.8	268 50.2	53.3	186 17.1	50.6	32 24.8	83 16 12.1	+ 99	
23	77 41.6	134 14.4	39.9	213 07.9	14.3	283 52.7	53.3	201 19.3	50.7	46 52.1	81 16 22.0	+ 97	
25	0	92 44.0	149 13.6	-21 39.3	228 08.7	-16 14.8	298 55.2	+11 53.3	216 21.5	-17 50.7	61 19.2	80 +16 31.7	+ 97
1	107 46.5	164 12.8	38.6	243 09.5	15.3	313 57.7	53.4	231 23.7	50.8	75 46.2	79 16 41.4	+ 96	
2	122 48.9	179 12.1	38.0	258 10.4	15.8	329 00.2	53.4	246 25.9	50.8	90 13.1	79 16 51.0	+ 95	
3	137 51.4	194 11.3	.. 37.3	273 11.2	.. 16.2	344 02.8	.. 53.4	261 28.1	.. 50.9	104 40.0	77 -17 00.5	+ 94	
4	152 53.9	209 10.5	36.6	288 12.1	16.7	359 05.3	53.5	276 30.3	50.9	119 06.7	75 17 09.9	+ 93	
5	167 56.3	224 09.7	36.0	303 12.9	17.2	14 07.8	53.5	291 32.5	51.0	133 33.2	75 17 19.2	+ 92	
6	182 58.8	239 08.9	-21 35.3	318 13.8	-16 17.7	29 10.3	+11 53.5	306 34.7	-17 51.0	147 59.7	74 +17 28.4	+ 91	
7	198 01.3	254 08.1	34.6	333 14.6	18.2	44 12.8	53.5	321 36.8	51.1	162 26.1	73 17 37.5	+ 91	
8	213 03.7	269 07.3	34.0	348 15.4	18.6	59 15.3	53.6	336 39.0	51.2	176 52.4	71 17 46.6	+ 89	
9	228 06.2	284 06.5	.. 33.3	3 16.3	.. 19.1	74 17.8	.. 53.6	351 41.2	.. 51.2	191 18.5	70 17 55.5	+ 88	
10	243 08.7	299 05.7	32.7	18 17.1	19.6	89 20.4	53.6	6 43.4	51.3	205 44.5	70 18 04.3	+ 87	
11	258 11.1	314 04.9	32.0	33 18.0	20.1	104 22.9	53.7	21 45.6	51.3	220 10.5	68 18 13.0	+ 87	
12	273 13.6	329 04.2	-21 31.3	48 18.8	-16 20.6	119 25.4	+11 53.7	36 47.8	-17 51.4	234 36.3	67 +18 21.7	+ 85	
13	288 16.1	344 03.4	30.6	63 19.6	21.0	134 27.9	53.7	51 50.0	51.4	249 02.0	66 18 30.2	+ 84	
14	303 18.5	359 02.6	30.0	78 20.5	21.5	149 30.4	53.8	66 52.2	51.5	263 27.6	65 18 38.6	+ 83	
15	318 21.0	14 01.8	.. 29.3	93 21.3	.. 22.0	164 32.9	.. 53.8	81 54.4	.. 51.5	277 53.1	64 -18 46.9	+ 82	
16	333 23.4	29 01.0	28.6	108 22.2	22.5	179 35.5	53.8	96 56.6	51.6	292 18.5	63 18 55.1	+ 81	
17	348 25.9	44 00.2	28.0	123 23.0	22.9	194 38.0	53.9	111 58.8	51.7	306 43.8	61 19 03.2	+ 79	
18	3 28.4	58 59.5	-21 27.3	138 23.8	-16 23.4	209 40.5	+11 53.9	127 01.0	-17 51.7	321 08.9	61 +19 11.1	+ 79	
19	18 30.8	73 58.7	26.6	153 24.7	23.9	224 43.0	53.9	142 03.2	51.8	335 34.0	59 19 19.0	+ 77	
20	33 33.3	88 57.9	25.9	168 25.5	24.4	239 45.5	54.0	157 05.4	51.8	349 58.9	59 19 26.7	+ 76	
21	48 35.8	103 57.1	.. 25.2	183 26.4	.. 24.9	254 48.1	.. 54.0	172 07.6	.. 51.9	4 23.8	57 -19 34.3	+ 75	
22	63 38.2	118 56.3	24.6	198 27.2	25.3	269 50.6	54.0	187 09.8	51.9	18 48.5	56 19 41.8	+ 74	
23	78 40.7	133 55.5	23.9	213 28.0	25.8	284 53.1	54.1	202 12.0	52.0	33 13.1	56 19 49.2	+ 72	
26	0	93 43.2	148 54.8	-21 23.2	228 28.9	-16 26.3	299 55.6	+11 54.1	217 14.2	-17 52.0	47 37.7	54 +19 56.4	+ 71
1	108 45.6	163 54.0	22.5	243 29.7	26.8	314 58.1	54.1	232 16.4	52.1	62 02.1	53 20 03.5	+ 70	
2	123 48.1	178 53.2	21.8	258 30.5	27.2	330 00.7	54.2	247 18.6	52.1	76 26.4	52 20 10.5	+ 69	
3	138 50.6	193 52.4	.. 21.2	273 31.4	.. 27.7	345 03.2	.. 54.2	262 20.7	.. 52.2	90 50.6	51 -20 17.4	+ 67	
4	153 53.0	208 51.6	20.5	288 32.2	28.2	0 05.7	54.2	277 22.9	52.3	105 14.7	50 20 24.1	+ 66	
5	168 55.5	223 50.9	19.8	303 33.1	28.7	15 08.2	54.3	292 25.1	52.3	119 38.7	49 20 30.7	+ 65	
6	183 57.9	238 50.1	-21 19.1	318 33.9	-16 29.1	30 10.8	+11 54.3	307 27.3	-17 52.4	134 02.6	48 +20 37.2	+ 63	
7	199 00.4	253 49.3	18.4	333 34.7	29.6	45 13.3	54.3	322 29.5	52.4	148 26.4	48 20 43.5	+ 62	
8	214 02.9	268 48.5	17.7	348 35.6	30.1	60 15.8	54.4	337 31.7	52.5	162 50.2	46 20 49.7	+ 61	
9	229 05.3	283 47.8	.. 17.0	3 36.4	.. 30.6	75 18.3	.. 54.4	352 33.9	.. 52.5	177 13.8	45 -20 55.8	+ 59	
10	244 07.8	298 47.0	16.3	18 37.2	31.0	90 20.8	54.4	7 36.1	52.6	191 37.3	44 21 01.7	+ 57	
11	259 10.3	313 46.2	15.6	33 38.1	31.5	105 23.4	54.5	22 38.3	52.6	206 00.7	43 21 07.4	+ 55	
12	274 12.7	328 45.4	-21 14.9	48 38.9	-16 32.0	120 25.9	+11 54.5	37 40.5	-17 52.7	220 24.0	43 +21 13.1	+ 55	
13	289 15.2	343 44.7	14.2	63 39.8	32.5	135 28.4	54.5	52 42.7	52.7	234 47.3	41 21 18.6	+ 53	
14	304 17.7	358 43.9	13.5	78 40.6	32.9	150 30.9	54.6	67 44.9	52.8	249 10.4	41 21 23.9	+ 52	
15	319 20.1	13 43.1	.. 12.8	93 41.4	.. 33.4	165 33.5	.. 54.6	82 47.1	.. 52.9	263 33.5	39 -21 29.1	+ 50	
16	334 22.6	28 42.4	12.1	108 42.3	33.9	180 36.0	54.6	97 49.3	52.9	277 56.4	39 21 34.1	+ 49	
17	349 25.1	43 41.6	11.4	123 43.1	34.4	195 38.5	54.7	112 51.5	53.0	292 19.3	38 21 39.0	+ 48	
18	4 27.5	58 40.8	-21 10.7	138 43.9	-16 34.8	210 41.1	+11 54.7	127 53.7	-17 53.0	306 42.1	37 +21 43.8	+ 46	
19	19 30.0	73 40.1	10.0	153 44.8	35.3	225 43.6	54.7	142 55.9	53.1	321 04.8	36 21 48.4	+ 44	
20	34 32.4	88 39.3	09.3	168 45.6	35.8	240 46.1	54.8	157 58.1	53.1	335 27.4	36 21 52.8	+ 43	
21	49 34.9	103 38.5	.. 08.6	183 46.4	.. 36.2	255 48.6	.. 54.8	173 00.3	.. 53.2	349 50.0	35 -21 57.1	+ 41	
22	64 37.4	118 37.7	07.9	198 47.3	36.7	270 51.2	54.8	188 02.5	53.2	4 12.5	34 22 01.2	+ 40	
23	79 39.8	133 37.0	07.2	213 48.1	37.2	285 53.7	54.9	203 04.7	53.3	18 34.9	33 22 05.2	+ 38	
24	94 42.3	148 36											

G M T	VENUS - 3.4		MARS 1.8		JUPITER - 1.9		SATURN 0.8		MOON			
	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
27 ^h	94 42.3	148 36.2	-21 06.5	228 48.9	-16 37.7	300 56.2	+11 54.9	218 06.9	-17 53.3	32 57.2	32 +22 09.0	+ 36
1	109 44.8	163 35.4	05.8	243 49.8	38.1	315 58.7	54.9	233 09.1	53.4	47 19.4	32 22 12.6	+ 35
2	124 47.2	178 34.7	05.1	258 50.6	38.6	331 01.3	55.0	248 11.3	53.4	61 41.6	31 22 16.1	+ 33
3	139 49.7	193 33.9	04.4	273 51.5	39.1	346 03.8	55.0	263 13.5	53.5	76 03.7	30 22 19.4	+ 32
4	154 52.2	208 33.2	03.7	288 52.3	39.5	1 06.3	55.1	278 15.7	53.6	90 25.7	30 22 22.6	+ 30
5	169 54.6	223 32.4	03.0	303 53.1	40.0	16 08.9	55.1	293 17.9	53.6	104 47.7	29 22 25.6	+ 28
6	184 57.1	238 31.6	-21 02.3	318 54.0	-16 40.5	31 11.4	+11 55.1	308 20.1	-17 53.7	119 09.6	29 +22 28.4	+ 27
7	199 59.5	253 30.9	01.5	333 54.8	41.0	46 13.9	55.2	323 22.3	53.7	133 31.5	27 22 31.1	+ 25
8	215 02.0	268 30.1	00.8	348 55.6	41.4	61 16.5	55.2	338 24.5	53.8	147 53.2	28 22 33.6	+ 23
9	230 04.5	283 29.3	-21 00.1	3 56.5	41.9	76 19.0	55.2	353 26.6	53.8	162 15.0	27 22 35.9	+ 22
10	245 06.9	298 28.6	20 59.4	18 57.3	42.4	91 21.5	55.3	8 28.8	53.9	176 36.7	26 22 38.1	+ 19
11	260 09.4	313 27.8	58.7	33 58.1	42.8	106 24.0	55.3	23 31.0	53.9	190 58.3	26 22 40.0	+ 19
12	275 11.9	328 27.1	-20 58.0	48 59.0	-16 43.3	121 26.6	+11 55.3	38 33.2	-17 54.0	205 19.9	25 +22 41.9	+ 16
13	290 14.3	343 26.3	57.2	63 59.8	43.8	136 29.1	55.4	53 35.4	54.0	219 41.4	25 22 43.5	+ 15
14	305 16.8	358 25.5	56.5	79 00.6	44.2	151 31.6	55.4	68 37.6	54.1	234 02.9	24 22 45.0	+ 13
15	320 19.3	13 24.8	55.8	94 01.5	44.7	166 34.2	55.5	83 39.8	54.1	248 24.3	24 22 46.3	+ 11
16	335 21.7	28 24.0	55.1	109 02.3	45.2	181 36.7	55.5	98 42.0	54.2	262 45.7	24 22 47.4	+ 9
17	350 24.2	43 23.3	54.3	124 03.1	45.6	196 39.2	55.5	113 44.2	54.3	277 07.1	23 22 48.3	+ 8
18	5 26.7	58 22.5	-20 53.6	139 03.9	-16 46.1	211 41.8	+11 55.6	128 46.4	-17 54.3	291 28.4	23 +22 49.1	+ 6
19	20 29.1	73 21.8	52.9	154 04.8	46.6	226 44.3	55.6	143 48.6	54.4	305 49.7	23 22 49.7	+ 4
20	35 31.6	88 21.0	52.2	169 05.6	47.0	241 46.9	55.6	158 50.8	54.4	320 11.0	22 22 50.1	+ 3
21	50 34.0	103 20.3	51.4	184 06.4	47.5	256 49.4	55.7	173 53.0	54.5	334 32.2	22 22 50.4	0
22	65 36.5	118 19.5	50.7	199 07.3	48.0	271 51.9	55.7	188 55.2	54.5	348 53.4	22 22 50.4	- 1
23	80 39.0	133 18.7	50.0	214 08.1	48.4	286 54.5	55.8	203 57.4	54.6	3 14.6	22 22 50.3	- 3
28 ^h	95 41.4	148 18.0	-20 49.2	229 08.9	-16 48.9	301 57.0	+11 55.8	218 59.6	-17 54.6	17 35.8	21 +22 50.0	- 4
1	110 43.9	163 17.2	48.5	244 09.8	49.4	316 59.5	55.8	234 01.8	54.7	31 56.9	22 22 49.6	- 7
2	125 46.4	178 16.5	47.8	259 10.6	49.8	332 02.1	55.9	249 04.0	54.7	46 18.1	21 22 48.9	- 8
3	140 48.8	193 15.7	47.0	274 11.4	50.3	347 04.6	55.9	264 06.2	54.8	60 39.2	21 22 48.1	- 10
4	155 51.3	208 15.0	46.3	289 12.3	50.8	2 07.1	55.9	279 08.4	54.8	75 00.3	21 22 47.1	- 11
5	170 53.8	223 14.2	45.6	304 13.1	51.2	17 09.7	56.0	294 10.6	54.9	89 21.4	21 22 46.0	- 14
6	185 56.2	238 13.5	-20 44.8	319 13.9	-16 51.7	32 12.2	+11 56.0	309 12.8	-17 54.9	103 42.5	21 +22 44.6	- 15
7	200 58.7	253 12.7	44.1	334 14.8	52.2	47 14.8	56.1	324 15.0	55.0	118 03.6	21 22 43.1	- 17
8	216 01.2	268 12.0	43.3	349 15.6	52.6	62 17.3	56.1	339 17.2	55.1	132 24.7	21 22 41.4	- 19
9	231 03.6	283 11.2	42.6	4 16.4	53.1	77 19.8	56.1	354 19.4	55.1	146 45.8	21 22 39.5	- 21
10	246 06.1	298 10.5	41.9	19 17.2	53.6	92 22.4	56.2	9 21.6	55.2	161 06.9	22 22 37.4	- 22
11	261 08.5	313 09.8	41.1	34 18.1	54.0	107 24.9	56.2	24 23.8	55.2	175 28.1	21 22 35.2	- 25
12	276 11.0	328 09.0	-20 40.4	49 18.9	-16 54.5	122 27.5	+11 56.3	39 26.0	-17 55.3	189 49.2	21 +22 32.7	- 25
13	291 13.5	343 08.3	39.6	64 19.7	55.0	137 30.0	56.3	54 28.2	55.3	204 10.3	22 22 30.2	- 28
14	306 15.9	358 07.5	38.9	79 20.6	55.4	152 32.5	56.3	69 30.4	55.4	218 31.5	22 22 27.4	- 30
15	321 18.4	13 06.8	38.1	94 21.4	55.9	167 35.1	56.4	84 32.6	55.4	232 52.7	22 22 24.4	- 31
16	336 20.9	28 06.0	37.4	109 22.2	56.3	182 37.6	56.4	99 34.8	55.5	247 13.9	22 22 21.3	- 33
17	351 23.3	43 05.3	36.6	124 23.0	56.8	197 40.2	56.5	114 37.0	55.5	261 35.1	23 22 18.0	- 34
18	6 25.8	58 04.5	-20 35.9	139 23.9	-16 57.3	212 42.7	+11 56.5	129 39.2	-17 55.6	275 56.4	22 +22 14.6	- 37
19	21 28.3	73 03.8	35.1	154 24.7	57.7	227 45.2	56.5	144 41.4	55.6	290 17.6	24 22 10.9	- 38
20	36 30.7	88 03.1	34.4	169 25.5	58.2	242 47.8	56.6	159 43.6	55.7	304 39.0	23 22 07.1	- 40
21	51 33.2	103 02.3	33.6	184 26.4	58.7	257 50.3	56.6	174 45.8	55.7	319 00.3	24 22 03.1	- 41
22	66 35.6	118 01.6	32.9	199 27.2	59.1	272 52.9	56.7	189 48.0	55.8	333 21.7	24 21 59.0	- 44
23	81 38.1	133 00.8	32.1	214 28.0	16 59.6	287 55.4	56.7	204 50.2	55.9	347 43.1	25 21 54.6	- 45
29 ^h	96 40.6	148 00.1	-20 31.4	229 28.8	-17 00.0	302 58.0	+11 56.8	219 52.4	-17 55.9	2 04.6	25 +21 50.1	- 46
1	111 43.0	162 59.4	30.6	244 29.7	00.5	318 00.5	56.8	234 54.6	56.0	16 26.1	25 21 45.5	- 49
2	126 45.5	177 58.6	29.8	259 30.5	01.0	333 03.0	56.8	249 56.8	56.0	30 47.6	26 21 40.6	- 50
3	141 48.0	192 57.9	29.1	274 31.3	01.4	348 05.6	56.9	264 59.0	56.1	45 09.2	27 21 35.6	- 51
4	156 50.4	207 57.2	28.3	289 32.2	01.9	3 08.1	56.9	280 01.2	56.1	59 30.9	27 21 30.5	- 54
5	171 52.9	222 56.4	27.6	304 33.0	02.3	18 10.7	57.0	295 03.4	56.2	73 52.6	28 21 25.1	- 55
6	186 55.4	237 55.7	-20 26.8	319 33.8	-17 02.8	33 13.2	+11 57.0	310 05.6	-17 56.2	88 14.4	28 +21 19.6	- 56
7	201 57.8	252 55.0	26.0	334 34.6	03.3	48 15.8	57.0	325 07.8	56.3	102 36.2	28 21 14.0	- 58
8	217 00.3	267 54.2	25.3	349 35.5	03.7	63 18.3	57.1	340 10.0	56.3	116 58.0	30 21 08.2	- 60
9	232 02.8	282 53.5	24.5	4 36.3	04.2	78 20.9	57.1	355 12.2	56.4	131 20.0	30 21 02.2	- 62
10	247 05.2	297 52.8	23.7	19 37.1	04.6	93 23.4	57.2	10 14.4	56.4	145 42.0	30 20 56.0	- 62
11	262 07.7	312 52.0	23.0	34 37.9	05.1	108 26.0	57.2	25 16.6	56.5	160 04.0	31 20 49.8	- 65
12	277 10.1	327 51.3	-20 22.2	49 38.8	-17 05.6	123 28.5	+11 57.3	40 18.8	-17 56.5	174 26.1	32 +20 43.3	- 66
13	292 12.6	342 50.6	21.4	64 39.6	06.0	138 31.1	57.3	55 21.0	56.6	188 48.3	33 20 36.7	- 68
14	307 15.1	357 49.8	20.7	79 40.4	06.5	153 33.6	57.3	70 23.3	56.6	203 10.6	33 20 29.9	- 69
15	322 17.5	12 49.1	19.9	94 41.2	06.9	168 36.1	57.4	85 25.5	56.7	217 32.9	34 20 23.0	- 70
16	337 20.0	27 48.4	19.1	109 42.1	07.4	183 38.7	57.4	100 27.7	56.7	231 55.3	35 20 16.0	- 72
17	352 22.5	42 47.6	18.3	124 42.9	07.8	198 41.2	57.5	115 29.9	56.8	246 17.8	36 20 08.8	- 74
18	7 24.9	57 46.9	-20 17.6	139 43.7	-17 08.3	213 43.8	+11 57.5	130 32.1	-17 56.8	260 40.4	36 +20 01.4	- 75
19	22 27.4	72 46.2	16.8	154 44.5	08.8	228 46.3	57.6	145 34.3	56.9	275 03.0	37 19 53.9	- 76
20	37 29.9	87 45.5	16.0	169 45.4	09.2	243 48.9	57.6	160 36.5	57.0	289 25.7	38 19 46.3	- 78
21	52 32.3	102 44.7	15.2	184 46.2	09.7	258 51.4	57.6	175 38.7	57.0	303 48.5	39 19 38.5	- 80
22	67 34.8	117 44.0	14.4	199 47.0	10.1	273 54.0	57.7	190 40.9	57.1	318 11.4	39 19 30.5	- 80
23	82 37.3	132 43.3	13.7	214 47.8	10.6	288 56.5	57.7	205 43.1	57.1	332 34.3	40 19 22.5	- 82
24	97 39.7	147 42.6	-20 12.9	229 48.7	-17 11.0	303 59.1	+11 57.8	220 45.3	-17 57.2	346 57.3	42 +19 14.3	- 84
code	-	- 7	+ 8	+ 8	- 5	+ 25	0	+ 22	0			

G M T	SUN		STARS				Lat.	Sunrise	Twilt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS			
	GHA	Dec.	No.	Name	SHA	Dec.				27	28	29	30				
	h	°	N.	°	°	°				h m	h m	h m	h m	Alt.	Sun's Low'r Limb Add	Venus Add	Mars Add
27 0	179 51.3	-23 22.2	7	Acamar	315 50.7	-40 28.9	72	6 56	14 55	14 55	14 55	14 55	14 55	0	0.6	0.1	0.1
1	194 51.0	22.1	5	Achernar	335 58.5	-57 27.8	70	6 46	15 50	15 50	15 50	15 50	15 50	30	0.6	0.1	0.1
2	209 50.7	22.0	30	Acrux	173 57.6	-62 51.1	68	6 39	16 23	16 23	16 23	16 23	16 23	45	0.6	0.1	0.0
3	224 50.4	21.9	19	Adhara	255 46.0	-28 54.7	66	6 34	16 47	16 47	16 47	16 47	16 47	60	0.6	0.0	0.0
4	239 50.1	21.8	10	Aldebaran	291 38.5	+16 25.4	64	6 28	17 05	17 05	17 05	17 05	17 05	75	0.6	0.0	0.0
5	254 49.8	21.7					62	6 22	17 20	17 20	17 20	17 20	17 20	90	0.6	0.0	0.0
6	269 49.5	-23 21.6	32	Alioth	166 58.5	+56 11.5	60	6 18	17 33	17 33	17 33	17 33	17 33				
7	284 49.2	21.5	34	Alkaid	153 32.9	+49 31.6	58	6 13	17 44	17 44	17 44	17 44	17 44				
8	299 48.9	21.5	55	Al Na'ir	28 38.0	-47 10.6	56	6 10	17 53	17 53	17 53	17 53	17 53				
9	314 48.6	21.4	15	Anilam	276 29.7	-1 13.8	54	6 06	18 01	18 01	18 01	18 01	18 01				
10	329 48.3	21.3	25	Alphard	218 38.1	-8 28.1	52	6 02	18 09	18 09	18 09	18 09	18 09				
11	344 48.0	21.2					50	5 59	18 15	18 15	18 15	18 15	18 15				
12	359 47.6	-23 21.1	41	Alphecca	126 47.7	+26 51.6	45	5 50	18 30	18 30	18 30	18 30	18 30				
13	14 47.3	21.0	1	Alpheratz	358 28.1	+28 51.1	40	5 42	18 41	18 41	18 41	18 41	18 41				
14	29 47.0	20.9	51	Altair	62 50.5	+8 45.1	35	5 35	18 51	18 51	18 51	18 51	18 51				
15	44 46.7	20.8	2	Ankaa	353 58.1	-42 32.8	30	5 29	19 00	19 00	19 00	19 00	19 00				
16	59 46.4	20.7	42	Antares	113 19.4	-26 20.1	20	5 14	19 15	19 15	19 15	19 15	19 15				
17	74 46.1	20.6					10	5 09	19 28	19 28	19 28	19 28	19 28				
18	89 45.8	-23 20.5	37	Arcturus	146 35.2	+19 24.5	0	5 04	19 40	19 40	19 40	19 40	19 40				
19	104 45.5	20.4	43	Atria	109 00.5	-68 56.9	10	5 40	19 52	19 52	19 52	19 52	19 52				
20	119 45.2	20.3	22	Avior	234 35.1	-59 22.0	20	5 21	20 05	20 05	20 05	20 05	20 05				
21	134 44.9	20.2	13	Bellatrix	279 17.9	+6 18.7	30	4 59	20 20	20 20	20 20	20 20	20 20				
22	149 44.6	20.1	16	Betelgeuse	271 47.6	+7 24.0	35	4 46	20 28	20 28	20 28	20 28	20 28				
23	164 44.3	20.0					40	4 31	20 38	20 38	20 38	20 38	20 38				
			17	Canopus	264 14.7	-52 40.3	45	4 13	20 49	20 49	20 49	20 49	20 49				
28 0	179 44.0	-23 19.9	12	Capella	281 37.6	+45 57.4	50	3 51	21 03	21 03	21 03	21 03	21 03				
1	194 43.7	19.8	53	Deneb	50 01.2	+45 07.6	52	3 40	21 10	21 10	21 10	21 10	21 10				
2	209 43.3	19.7	28	Denebola	183 17.5	+14 48.9	54	3 28	21 17	21 17	21 17	21 17	21 17				
3	224 43.0	19.6	4	Diphda	349 39.0	-18 13.7	56	3 14	21 24	21 24	21 24	21 24	21 24				
4	239 42.7	19.5					58	2 57	21 33	21 33	21 33	21 33	21 33				
5	254 42.4	19.3	27	Dubhe	194 44.1	+61 58.9	60	2 37	21 43	21 43	21 43	21 43	21 43				
6	269 42.1	-23 19.2	14	Elnath	279 06.7	+28 34.3	S										
7	284 41.8	19.1	47	Eltanin	91 06.7	+51 29.6											
8	299 41.5	19.0	54	Enif	34 29.6	+9 40.5											
9	314 41.2	18.9	56	Fomalhaut	16 11.5	-29 51.4											
10	329 40.9	18.8															
11	344 40.6	18.7	31	Gacrux	172 49.0	-56 51.8	72	17 06	12 12	12 12	12 12	12 12	12 12				
12	359 40.3	-23 18.6	29	Gienah	176 36.6	-17 17.9	70	17 15	11 16	11 16	11 16	11 16	11 16				
13	14 40.0	18.4	35	Hadar	149 49.4	-60 09.5	68	17 22	10 43	10 43	10 43	10 43	10 43				
14	29 39.7	18.3	6	Hamal	328 49.2	+23 15.5	66	13 29	9 58	9 58	9 58	9 58	9 58				
15	44 39.4	18.2	48	Kaus Aust.	84 41.3	-34 24.4	64	14 10	9 41	9 41	9 41	9 41	9 41				
16	59 39.1	18.1					62	14 38	9 42	9 42	9 42	9 42	9 42				
17	74 38.7	18.0	40	Kochab	137 18.7	+74 19.8	60	14 59	9 29	9 29	9 29	9 29	9 29				
18	89 38.4	-23 17.9	57	Markab	14 21.4	+14 58.3	58	15 16	8 44	8 44	8 44	8 44	8 44				
19	104 38.1	17.7	8	Menkar	314 59.9	+3 55.2	56	15 31	8 31	8 31	8 31	8 31	8 31				
20	119 37.8	17.6	36	Menkent	148 58.6	-36 09.2	54	15 44	8 20	8 20	8 20	8 20	8 20				
21	134 37.5	17.5	24	Miap'dus	221 48.2	-69 32.0	52	15 55	8 10	8 10	8 10	8 10	8 10				
22	149 37.2	17.4					50	16 04	8 03	8 03	8 03	8 03	8 03				
23	164 36.9	17.2	9	Mirfak	309 41.7	+49 42.6	45	16 25	7 41	7 41	7 41	7 41	7 41				
			50	Nunki	76 52.0	-26 21.2	40	16 41	7 25	7 25	7 25	7 25	7 25				
29 0	179 36.6	-23 17.1	52	Peacock	54 27.5	-56 52.7	35	16 56	7 12	7 12	7 12	7 12	7 12				
1	194 36.3	17.0	21	Pollux	244 20.0	+28 07.9	30	17 08	7 00	7 00	7 00	7 00	7 00				
2	209 36.0	16.9	20	Procyon	245 44.4	+5 20.2	20	17 29	6 40	6 40	6 40	6 40	6 40				
3	224 35.7	16.7					10	17 48	6 23	6 23	6 23	6 23	6 23				
4	239 35.4	16.6	46	R'alhague	96 46.8	+12 35.4	0	18 05	6 07	6 07	6 07	6 07	6 07				
5	254 35.1	16.5	26	Regulus	208 29.1	+12 10.8	10	18 22	5 50	5 50	5 50	5 50	5 50				
6	269 34.8	-23 16.4	11	Rigel	281 53.1	-8 15.1	20	18 41	5 32	5 32	5 32	5 32	5 32				
7	284 34.5	16.2	38	Rigel Kent.	140 51.0	-60 39.1	30	19 03	5 12	5 12	5 12	5 12	5 12				
8	299 34.2	16.1	44	Sabik	103 02.3	-15 40.3	35	19 16	5 00	5 00	5 00	5 00	5 00				
9	314 33.9	16.0					40	19 31	4 46	4 46	4 46	4 46	4 46				
10	329 33.6	15.8	3	Schedar	350 29.7	+56 18.2	45	19 49	4 29	4 29	4 29	4 29	4 29				
11	344 33.3	15.7	45	Shaula	97 20.8	-37 04.4	50	20 11	4 09	4 09	4 09	4 09	4 09				
12	359 33.0	-23 15.6	18	Sirius	259 11.3	-16 39.3	52	20 22	3 59	3 59	3 59	3 59	3 59				
13	14 32.6	15.4	33	Spica	159 16.8	-10 56.0	54	20 34	3 48	3 48	3 48	3 48	3 48				
14	29 32.3	15.3	23	Suhail	223 23.8	-43 15.2	56	20 49	3 36	3 36	3 36	3 36	3 36				
15	44 32.0	15.2					58	21 05	3 21	3 21	3 21	3 21	3 21				
16	59 31.7	15.0	49	Vega	81 08.6	+38 44.6	60	21 25	3 04	3 04	3 04	3 04	3 04				
17	74 31.4	14.9	39	Zub'g'bi	137 53.3	-15 51.6	S										
18	89 31.1	-23 14.8	Equation of Time (App. - Mean)				GMT of Transit Meridian of Greenwich										
19	104 30.8	14.6															
20	119 30.5	14.5															
21	134 30.2	14.3															
22	149 29.9	14.2															
23	164 29.6	14.0															
24	179 29.3	-23 13.9															
code	-	+ 2															
			0	- 0 34.0	- 1 03.6	- 1 33.0		DAY	Moon	Venus	Mars	Jupiter	Saturn				
			6	- 0 41.4	- 1 10.9	- 1 40.3		27	22 46	14 06	8 44	3 56	9 26				

G M T	☿		VENUS — 3.4		MARS 1.7		JUPITER — 1.9		SATURN 0.8		MOON			
	GHA		GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	Dec.	GHA	code	Dec.	code
h	o	'	o	'	o	'	o	'	o	'	o	'	o	'
30	0	97 39.7	147 42.6	-20 12.9	229 48.7	-17 11.0	303 59.1	+11 57.8	220 45.3	-17 57.2	346 57.3	42	+19 14.3	- 84
	1	112 42.2	162 41.8	12.1	244 49.5	11.5	319 01.6	57.8	235 47.5	57.2	1 20.5	42	19 05.9	- 84
	2	127 44.1	177 41.1	11.3	259 50.3	12.0	334 04.2	57.9	250 49.7	57.3	15 43.7	43	18 57.5	- 87
	3	142 47.1	192 40.4	.. 10.5	274 51.1	.. 12.4	349 06.8	.. 57.9	265 51.9	.. 57.3	30 07.0	44	18 48.8	- 87
	4	157 49.6	207 39.7	09.8	289 52.0	12.9	4 09.3	57.9	280 54.1	57.4	44 30.4	44	18 40.1	- 89
	5	172 52.0	222 39.0	09.0	304 52.8	13.3	19 11.9	58.0	295 56.3	57.4	58 53.8	46	18 31.2	- 90
	6	187 54.5	237 38.2	-20 08.2	319 53.6	-17 13.8	34 14.4	+11 58.0	310 58.5	-17 57.5	73 17.4	47	+18 22.2	- 91
	7	202 57.0	252 37.5	07.4	334 54.4	14.2	49 17.0	58.1	326 00.7	57.5	87 41.1	47	18 13.1	- 92
	8	217 59.4	267 36.8	06.6	349 55.3	14.7	64 19.5	58.1	341 02.9	57.6	102 04.8	49	18 03.9	- 94
	9	233 01.9	282 36.1	.. 05.8	4 56.1	.. 15.1	79 22.1	.. 58.2	356 05.1	.. 57.6	116 28.7	49	17 54.5	- 95
	10	248 04.4	297 35.4	05.0	19 56.9	15.6	94 24.6	58.2	11 07.3	57.7	130 52.6	50	17 45.0	- 96
	11	263 06.8	312 34.6	04.2	34 57.7	16.1	109 27.2	58.3	26 09.5	57.7	145 16.6	52	17 35.4	- 97
	12	278 09.3	327 33.9	-20 03.4	49 58.5	-17 16.5	124 29.7	+11 58.3	41 11.7	-17 57.8	159 40.8	52	+17 25.7	- 99
	13	293 11.8	342 33.2	02.6	64 59.4	17.0	139 32.3	58.4	56 13.9	57.8	174 05.0	53	17 15.8	- 99
	14	308 14.2	357 32.5	01.9	80 00.2	17.4	154 34.9	58.4	71 16.1	57.9	188 29.3	54	17 05.9	-101
	15	323 16.7	12 31.8	.. 01.1	95 01.0	.. 17.9	169 37.4	.. 58.4	86 18.3	.. 57.9	202 53.7	56	16 55.8	-102
	16	338 19.1	27 31.1	20 00.3	110 01.8	18.3	184 40.0	58.5	101 20.5	58.0	217 18.3	56	16 45.6	-102
	17	353 21.6	42 30.3	19 59.5	125 02.7	18.8	199 42.5	58.5	116 22.7	58.0	231 42.9	57	16 35.4	-104
	18	8 24.1	57 29.6	-19 58.7	140 03.5	-17 19.2	214 45.1	+11 58.6	131 24.9	-17 58.1	246 07.6	58	+16 25.0	-105
	19	23 26.5	72 28.9	57.9	155 04.3	19.7	229 47.6	58.6	146 27.1	58.1	260 32.4	59	16 14.5	-106
	20	38 29.0	87 28.2	57.1	170 05.1	20.1	244 50.2	58.7	161 29.4	58.2	274 57.3	60	16 03.9	-107
	21	53 31.5	102 27.5	.. 56.3	185 05.9	.. 20.6	259 52.7	.. 58.7	176 31.6	.. 58.2	289 22.3	61	15 53.2	-108
	22	68 33.9	117 26.8	55.5	200 06.8	21.0	274 55.3	58.8	191 33.8	58.3	303 47.4	62	15 42.4	-109
	23	83 36.4	132 26.1	54.7	215 07.6	21.5	289 57.9	58.8	206 36.0	58.3	318 12.6	63	15 31.5	-109
31	0	98 38.9	147 25.4	-19 53.8	230 08.4	-17 21.9	305 00.4	+11 58.9	221 38.2	-17 58.4	332 37.9	64	+15 20.6	-111
	1	113 41.3	162 24.7	53.0	245 09.2	22.4	320 03.0	58.9	236 40.4	58.4	347 03.3	65	15 09.5	-112
	2	128 43.8	177 23.9	52.2	260 10.0	22.8	335 05.5	59.0	251 42.6	58.5	1 28.8	66	14 58.3	-112
	3	143 46.2	192 23.2	.. 51.4	275 10.9	.. 23.3	350 08.1	.. 59.0	266 44.8	.. 58.6	15 54.4	67	14 47.1	-113
	4	158 48.7	207 22.5	50.6	290 11.7	23.7	5 10.7	59.1	281 47.0	58.6	30 20.1	69	14 35.8	-114
	5	173 51.2	222 21.8	49.8	305 12.5	24.2	20 13.2	59.1	296 49.2	58.7	44 46.0	69	14 24.4	-115
	6	188 53.6	237 21.1	-19 49.0	320 13.3	-17 24.6	35 15.8	+11 59.1	311 51.4	-17 58.7	59 11.9	70	+14 12.9	-116
	7	203 56.1	252 20.4	48.2	335 14.1	25.1	50 18.3	59.2	326 53.6	58.8	73 37.9	71	14 01.3	-117
	8	218 58.6	267 19.7	47.4	350 15.0	25.5	65 20.9	59.2	341 55.8	58.8	88 04.0	72	13 49.6	-117
	9	234 01.0	282 19.0	.. 46.6	5 15.8	.. 26.0	80 23.5	.. 59.3	356 58.0	.. 58.9	102 30.2	73	13 37.9	-118
	10	249 03.5	297 18.3	45.7	20 16.6	26.4	95 26.0	59.3	12 00.2	58.9	116 56.5	74	13 26.1	-119
	11	264 06.0	312 17.6	44.9	35 17.4	26.9	110 28.6	59.4	27 02.4	59.0	131 22.9	75	13 14.2	-119
	12	279 08.4	327 16.9	-19 44.1	50 18.2	-17 27.3	125 31.2	+11 59.4	42 04.6	-17 59.0	145 49.4	76	+13 02.3	-121
	13	294 10.9	342 16.2	43.3	65 19.0	27.8	140 33.7	59.5	57 06.8	59.1	160 16.0	76	12 50.2	-121
	14	309 13.4	357 15.5	42.5	80 19.9	28.2	155 36.3	59.5	72 09.1	59.1	174 42.6	78	12 38.1	-121
	15	324 15.8	12 14.8	.. 41.7	95 20.7	.. 28.7	170 38.8	.. 59.6	87 11.3	.. 59.2	189 09.4	79	12 26.0	-122
	16	339 18.3	27 14.1	40.8	110 21.5	29.1	185 41.4	59.6	102 13.5	59.2	203 36.3	80	12 13.8	-123
	17	354 20.7	42 13.4	40.0	125 22.3	29.6	200 44.0	59.7	117 15.7	59.3	218 03.3	81	12 01.5	-123
	18	9 23.2	57 12.7	-19 39.2	140 23.1	-17 30.0	215 46.5	+11 59.7	132 17.9	-17 59.3	232 30.4	81	+11 49.2	-124
	19	24 25.7	72 12.0	38.4	155 24.0	30.5	230 49.1	59.8	147 20.1	59.4	246 57.5	83	11 36.8	-125
	20	39 28.1	87 11.3	37.6	170 24.8	30.9	245 51.7	59.8	162 22.3	59.4	261 24.8	84	11 24.3	-125
	21	54 30.6	102 10.6	.. 36.7	185 25.6	.. 31.4	260 54.2	.. 59.9	177 24.5	.. 59.5	275 52.2	84	11 11.8	-126
	22	69 33.1	117 09.9	35.9	200 26.4	31.8	275 56.8	11 59.9	192 26.7	59.5	290 19.6	86	10 59.2	-126
	23	84 35.5	132 09.2	35.1	215 27.2	32.2	290 59.4	12 00.0	207 28.9	59.6	304 47.2	86	10 46.6	-126
1	0	99 38.0	147 08.5	-19 34.2	230 28.0	-17 32.7	306 01.9	+12 00.0	222 31.1	-17 59.6	319 14.8	87	+10 34.0	-127
	1	114 40.5	162 07.8	33.4	245 28.9	33.1	321 04.5	00.1	237 33.3	59.7	333 42.5	88	10 21.3	-128
	2	129 42.9	177 07.1	32.6	260 29.7	33.6	336 07.1	00.1	252 35.5	59.7	348 10.3	89	10 08.5	-128
	3	144 45.4	192 06.4	.. 31.8	275 30.5	.. 34.0	351 09.6	.. 00.2	267 37.7	.. 59.8	2 38.2	90	9 55.7	-128
	4	159 47.9	207 05.7	30.9	290 31.3	34.5	6 12.2	00.2	282 39.9	59.8	17 06.2	91	9 42.9	-129
	5	174 50.3	222 05.0	30.1	305 32.1	34.9	21 14.8	00.3	297 42.2	59.9	31 34.3	92	9 30.0	-129
	6	189 52.8	237 04.4	-19 29.3	320 32.9	-17 35.4	36 17.3	+12 00.3	312 44.4	-17 59.9	46 02.5	93	+ 9 17.1	-130
	7	204 55.2	252 03.7	28.4	335 33.7	35.8	51 19.9	00.4	327 46.6	18 00.0	60 30.8	93	9 04.1	-130
	8	219 57.7	267 03.0	27.6	350 34.6	36.3	66 22.5	00.4	342 48.8	00.0	74 59.1	94	8 51.1	-130
	9	235 00.2	282 02.3	.. 26.8	5 35.4	.. 36.7	81 25.0	.. 00.5	357 51.0	.. 00.1	89 27.5	96	8 38.1	-131
	10	250 02.6	297 01.6	25.9	20 36.2	37.1	96 27.6	00.5	12 53.2	00.1	103 56.1	95	8 25.0	-131
	11	265 05.1	312 00.9	25.1	35 37.0	37.6	111 30.2	00.6	27 55.4	00.2	118 24.6	97	8 11.9	-131
	12	280 07.6	327 00.2	-19 24.2	50 37.8	-17 38.0	126 32.8	+12 00.6	42 57.6	-18 00.2	132 53.3	98	+ 7 58.8	-131
	13	295 10.0	341 59.5	23.4	65 38.6	38.5	141 35.3	00.7	57 59.8	00.3	147 22.1	98	7 45.7	-132
	14	310 12.5	356 58.8	22.6	80 39.5	38.9	156 37.9	00.7	73 02.0	00.3	161 50.9	100	7 32.5	-132
	15	325 15.0	11 58.2	.. 21.7	95 40.3	.. 39.4	171 40.5	.. 00.8	88 04.2	.. 00.4	176 19.9	100	7 19.3	-132
	16	340 17.4	26 57.5	20.9	110 41.1	39.8	186 43.0	00.8	103 06.4	00.4	190 48.9	100	7 06.1	-133
	17	355 19.9	41 56.8	20.0	125 41.9	40.2	201 45.6	00.9	118 08.7	00.5	205 17.9	102	6 52.8	-132
	18	10 22.4	56 56.1	-19 19.2	140 42.7	-17 40.7	216 48.2	+12 00.9	133 10.9	-18 00.5	219 47.1	102	+ 6 39.6	-133
	19	25 24.8	71 55.4	18.3	155 43.5	41.1	231 50.8	01.0	148 13.1	00.6	234 16.3	103	6 26.3	-133
	20	40 27.3	86 54.7	17.5	170 44.3	41.6	246 53.3	01.0	163 15.3	00.6	248 45.6	104	6 13.0	-133
	21	55 29.7	101 54.0	.. 16.6	185 45.1	.. 42.0	261 55.9	.. 01.1	178 17.5	.. 00.7	263 15.0	105	5 59.7	-133
	22	70 32.2	116 53.4	15.8	200 46.0	42.4	276 58.5	01.1	193 19.7	00.7	277 44.5	105	5 46.4	-134
	23	85 34.7	131 52.7	15.0	215 46.8	42.9	292 01.0	01.2	208 21.9	00.8	292 14.0	106	5 33.0	-133
24		100 37.1	146 52.0	-19 14.1	230 47.6	-17 43.3	307 03.6	+12 01.2	223 24.1	-18 00.8	306 43.6	107	+ 5 19.7	-134
code		-	- 7	+ 8	+ 8	- 5	+ 25	+ 1	+ 22	- 1				

G M T	SUN		STARS				Lat.	Sunrise	Twlt. begins	Moonrise				ADDITIONAL ALTITUDE CORRECTIONS			
	GHA	Dec.	No.	Name	SHA	Dec.				30	31	1		Alt.	Sun's Low'r Limb	Venus	Mars
	h	m								h m	h m	h m	h m				
30	179 29.3	-23 13.9	7	Acamar	315 50.7	-40 28.9	72	■	6 55	14 55	17 52	20 09					
1	194 29.0	13.8	5	Achernar	335 58.5	-57 27.8	70	■	6 47	15 50	18 13	20 19					
2	209 28.7	13.6	30	Acrux	173 57.5	-62 51.1	68	■	6 39	16 23	18 30	20 26					
3	224 28.4	.. 13.5	19	Adhara	255 46.0	-28 54.7	66	10 31	6 33	16 47	18 43	20 32					
4	239 28.1	13.3	10	Aldebaran	291 38.5	+16 25.4	64	9 51	6 28	17 05	18 54	20 37					
5	254 27.8	13.2					62	9 24	6 23	17 20	19 03	20 42					
6	269 27.5	-23 13.0	32	Alioth	166 58.4	+56 11.5	60	9 03	6 18	17 33	19 11	20 46					
7	284 27.2	12.9	34	Alkaid	153 32.9	+49 31.6	58	8 46	6 14	17 44	19 18	20 49					
8	299 26.9	12.7	55	Al Na'ir	28 38.0	-47 10.6	56	8 32	6 10	17 53	19 24	20 52					
9	314 26.6	.. 12.6	15	Anilam	276 29.7	-1 13.8	54	8 19	6 06	18 01	19 29	20 55					
10	329 26.3	12.4	25	Alphard	218 38.1	-8 28.1	52	8 08	6 02	18 09	19 34	20 57					
11	344 26.0	12.3					50	7 59	6 00	18 15	19 39	20 59					
12	359 25.7	-23 12.1	41	Alphecca	126 47.7	+26 51.5	45	7 38	5 51	18 30	19 48	21 04					
13	14 25.4	12.0	1	Alpheratz	358 28.1	+28 51.1	40	7 22	5 43	18 41	19 56	21 08					
14	29 25.1	11.8	51	Altair	62 50.5	+8 45.1	35	7 08	5 36	18 51	20 03	21 11					
15	44 24.8	.. 11.7	2	Ankaa	353 58.1	-42 32.8	30	6 55	5 30	19 00	20 09	21 14					
16	59 24.5	11.5	42	Antares	113 19.4	-26 20.1	20	6 35	5 15	19 15	20 19	21 20					
17	74 24.2	11.3					10	6 16	5 01	19 28	20 28	21 24					
18	89 23.9	-23 11.2	37	Arcturus	146 35.1	+19 24.5	0	5 59	4 44	19 40	20 36	21 29					
19	104 23.6	11.0	43	Atria	109 00.5	-68 56.9	10	5 42	4 23	19 52	20 45	21 33					
20	119 23.3	10.9	22	Avior	234 35.1	-59 22.0	20	5 23	3 58	20 05	20 54	21 38					
21	134 23.0	.. 10.7	13	Bellatrix	279 17.9	+6 18.7	30	5 01	3 25	20 20	21 04	21 43					
22	149 22.7	10.5	16	Betel'ge	271 47.6	+7 24.0	35	4 48	3 01	20 28	21 10	21 46					
23	164 22.4	10.4					40	4 33	2 31	20 38	21 16	21 49					
31	179 22.1	-23 10.2	17	Canopus	264 14.7	-52 40.3	45	4 16	1 44	20 49	21 24	21 53					
1	194 21.8	10.1	12	Capella	281 37.6	+45 57.4	50	3 53	///	21 03	21 33	21 58					
2	209 21.5	09.9	53	Deneb	50 01.3	+45 07.6	52	3 43	///	21 10	21 37	22 00					
3	224 21.2	.. 09.7	28	Denebola	183 17.4	+14 48.9	54	3 30	///	21 17	21 42	22 02					
4	239 20.9	09.6	4	Diphda	349 39.0	-18 13.7	56	3 17	///	21 24	21 47	22 05					
5	254 20.6	09.4					58	3 00	///	21 33	21 53	22 08					
6	269 20.3	-23 09.2	27	Dubhe	194 44.1	+61 58.9	60	2 40	///	21 43	21 59	22 11					
7	284 20.0	09.1	14	Elnath	279 06.7	+28 34.3	S										
8	299 19.7	08.9	47	Eltanin	91 06.7	+51 29.6											
9	314 19.4	.. 08.7	54	Enif	34 29.6	+9 40.5											
10	329 19.1	08.5	56	Fomalhaut	16 11.6	-29 51.4											
11	344 18.8	08.4	31	Gacrux	172 49.0	-56 51.8	72	17 10	12 12	11 17	10 50						
12	359 18.5	-23 08.2	29	Gienah	176 36.6	-17 17.9	70	17 18	11 16	10 53	10 38						
13	14 18.2	08.0	35	Hadar	149 49.3	-60 09.5	68	17 25	10 43	10 35	10 28						
14	29 17.9	07.8	6	Hamal	328 49.2	+23 15.5	66	13 35	17 32	10 18	10 20	10 20					
15	44 17.6	.. 07.7	48	Kaus Aust.	84 41.3	-34 24.4	64	14 15	17 38	9 58	10 08	10 14					
16	59 17.3	07.5					62	14 42	17 43	9 42	9 58	10 08					
17	74 17.0	07.3	40	Kochab	137 18.7	+74 19.8	60	15 03	17 48	9 29	9 48	10 02					
18	89 16.7	-23 07.1	57	Markab	14 21.4	+14 58.3	58	15 20	17 52	9 17	9 40	9 58					
19	104 16.4	07.0	8	Menkar	314 59.9	+3 55.1	56	15 34	17 56	9 07	9 33	9 54					
20	119 16.1	06.8	36	Menkent	148 58.6	-36 09.2	54	15 46	17 59	8 58	9 27	9 50					
21	134 15.8	.. 06.6	24	Miapl'dus	221 48.2	-69 32.1	52	15 57	18 02	8 50	9 22	9 47					
22	149 15.5	06.4					50	16 07	18 06	8 43	9 16	9 44					
23	164 15.2	06.2	9	Mirfak	309 41.7	+49 42.6	45	16 27	18 13	8 27	9 05	9 37					
1	179 14.9	-23 06.1	50	Nunki	76 52.0	-26 21.2	40	16 44	18 21	8 15	8 56	9 31					
2	194 14.6	05.9	52	Peacock	54 27.5	-56 52.7	35	16 58	18 29	8 04	8 48	9 26					
3	209 14.3	05.7	21	Pollux	244 19.9	+28 07.9	30	17 10	18 35	7 54	8 41	9 22					
4	224 14.0	.. 05.5	20	Procyon	245 44.4	+5 20.2	20	17 31	18 50	7 37	8 28	9 15					
5	239 13.7	05.3					10	17 49	19 04	7 23	8 18	9 08					
6	254 13.4	05.1	46	R'alhague	96 46.7	+12 35.4	0	18 07	19 22	7 09	8 07	9 02					
7	269 13.1	-23 05.0	26	Regulus	208 29.1	+12 10.8	10	18 24	19 42	6 55	7 57	8 55					
8	284 12.8	04.8	11	Rigel	281 53.1	-8 15.1	20	18 42	20 06	6 40	7 46	8 48					
9	299 12.5	04.6	38	Rigel Kent.	140 51.0	-60 39.1	30	19 04	20 40	6 23	7 33	8 40					
10	314 12.2	.. 04.4	44	Sabik	103 02.3	-15 40.3	35	19 17	21 03	6 13	7 26	8 36					
11	329 11.9	04.2					40	19 32	21 34	6 01	7 17	8 31					
12	344 11.6	04.0	3	Schedar	350 29.7	+56 18.2	45	19 50	22 21	5 47	7 07	8 24					
13	359 11.3	-23 03.8	45	Shaula	97 20.8	-37 04.4	50	20 12	///	5 31	6 55	8 17					
14	14 11.0	03.6	18	Sirius	259 11.3	-16 39.3	52	20 22	///	5 23	6 49	8 14					
15	29 10.7	03.4	33	Spica	159 16.7	-10 56.0	54	20 34	///	5 14	6 43	8 10					
16	44 10.4	.. 03.2	23	Suhail	223 23.8	-43 15.2	56	20 48	///	5 04	6 36	8 06					
17	59 10.1	03.0					58	21 05	///	4 53	6 28	8 01					
18	74 9.8	02.8	49	Vega	81 08.6	+38 44.5	60	21 24	///	4 39	6 19	7 56					
19	89 9.5	-23 02.6	39	Zub'g'bi	137 53.3	-15 51.6	S										
20	104 9.2	02.4															
21	119 8.9	02.3															
22	134 8.6	.. 02.1															
23	149 8.3	01.9															
24	164 8.0	01.7															
code	-	+ 2															

EXPLANATION AND EXAMPLES

1. *Object.* The object of this volume is to provide in convenient form the astronomical data required by mariners. In the front part of the book two facing pages give complete data for every hour of three days. The yellow pages give 60 tables, one for every minute of the hour. Each table has two parts. One part (consisting of the first four columns) has 61 lines, one for every second of the minute, used to bring the hourly value of the Greenwich hour angle (GHA) up to the minute and second of observation. The other part (making up the last three columns), with 181 values, is for use in bringing the hourly value of the declination up to the minute of observation; and also for obtaining small corrections to the GHA of the planets and Moon. Altitude correction tables are on the covers, and small additional altitude corrections for the Sun, Moon, Venus, and Mars are on the daily pages.

2. *Sun, Moon, planets, and Vernal equinox (Υ).* The daily pages give the GHA and Dec. of the Sun, Moon, and four planets at 1-hour intervals, and also a code at the foot of the column (at the right for the Moon) to be used with the yellow table, except for the GHA of the Sun and (Υ), where no code is needed. The sign of the code correction is the sign attached to the code on the daily pages; for the Moon's GHA the sign (not printed) is always plus. The magnitudes of the planets are given in the headings.

Example: For 1955 January 4, 16^h 23^m 12^s, Greenwich mean time, find the GHA and Dec. of the Sun.

	GHA	Dec.	code
(From daily page for Jan. 4, 5, 6) Jan. 4, 16 ^h	58 47.2	-22 45.4	+2
(From yellow table 23 ^m , Sun, 12 ^s) 23 ^m 12 ^s	5 48.0		
(From yellow table 23 ^m , code 2) code correction		+0.1	
The required GHA and Dec.	64 35.2	-22 45.3	

Example: For 1955 January 5, 9^h 12^m 49^s GMT, find the GHA and Dec. of Venus.

	GHA	code	Dec.	code
(From daily page for Jan. 4, 5, 6) Jan. 5, 9 ^h	1 14.3	+4	-16 04.4	-4
(From yellow table 12 ^m , planets, 49 ^s) 12 ^m 49 ^s	3 12.3			
(From yellow table 12 ^m , code 4) code correction	+0.1		-0.1	
The required GHA and Dec.	4 26.7		-16 04.5	

Example: For 1955 January 6, 14^h 14^m 27^s GMT, find the GHA and Dec. of the Moon.

	GHA	code	Dec.	code
(From daily page for Jan. 4, 5, 6) Jan. 6, 14 ^h	237 30.8	+28	+24 29.7	-3
(From yellow table 14 ^m , Moon, 27 ^s) 14 ^m 27 ^s	3 26.9			
(From yellow table 14 ^m , codes 28 and 3) code correction	+0.7		-0.1	
The required GHA and Dec.	240 58.4		+24 29.6	

3. *Stars.* The GHA of a star is found by adding the GHA of the vernal equinox to the star's sidereal hour angle:

$$\text{GHA}^* = \text{GHA}\Upsilon + \text{SHA}^*.$$

On the right-hand daily pages are given the SHA, Dec., and names of 57 stars. The data are for the middle of the second day. The SHA and Dec. may be used without appreciable error for three days. The names and magnitudes of the stars are given inside the front cover, and also on the outside of the back cover.

Example: For 1955 January 8, 18^h 44^m 19^s GMT, find the GHA and Dec. of star 12, Capella.

	GHA	Dec.
(From daily page for Jan. 7, 8, 9) SHA and Dec.	281 38.7	+45 57.4
(From daily page for Jan. 7, 8, 9) GHA Υ , Jan. 8, 18 ^h	17 30.7	
(From yellow table 44 ^m , Υ , 19 ^s) 44 ^m 19 ^s	11 06.6	
The required GHA	310 16.0	

The Greenwich mean time of transit over the meridian of Greenwich may be obtained, if desired, by finding the GMT at which GHA Υ is the same as $360^\circ - \text{SHA}^*$.

The SHA, Dec., and magnitude of 172 stars (including the 57 standard stars) are given for the middle of each month on pages 254-259.

4. *Altitude Corrections.* Three altitude corrections are given, except for the stars, Jupiter, and Saturn, where only two are needed. The correction for *height of eye*, used for all objects observed with a marine sextant, is inside the front cover. For the *Sun's lower limb*, use also the correction from the Sun table inside the front cover and add the small additional correction from the daily page. For *stars* and *planets*, use (in addition to the dip correction) the correction from the star and planet table inside the front cover, and for *Venus* and *Mars* add the small additional correction from the daily page. For the *Moon*, use (in addition to the dip correction) the correction from the Moon table inside the back cover and apply the additional limb correction from the daily page; the limb corrections are given for 12^h GMT of each day, and may be taken directly out of the table without interpolation.

Example: Correct the following observed altitudes, taken at height 35 feet on 1955 January 8.

	Sun (lower limb) ° ' "	Moon (upper limb) ° ' "	Moon (lower limb) ° ' "	Venus ° ' "	Polaris ° ' "
Observed altitude	24 16.2	38 16.5	37 58.2	25 14.6	40 13.2
Height of eye	- 5.6	- 5.6	- 5.6	-5.6	-5.6
Cover tables (From daily page)	+13.7	+43.5	+43.7	-2.0	-1.1
additional cor- rection	+ 0.6	-14.1	+18.5	+0.3	
Corrected altitude	24 24.9	38 40.3	38 54.8	25 07.3	40 06.5

Caution. In H. O. 218 and in the preliminary edition of H. O. 249, refraction at a height of eye of 5000 feet is already included, and the altitude corrections in this book are not to be used.

Sun's upper limb and Bubble sextant observations. If the upper limb of the Sun is observed, correct the altitude as if the lower limb had been observed, and apply the additional correction from the table below.

ADDITIONAL CORRECTION FOR SUN'S UPPER LIMB

(to be applied to the correction for the lower limb)

Dates	Correction	Dates
Jan. 1 to Jan. 26	-33.8	Dec. 12 to Dec. 31
Jan. 27 to Feb. 14	-33.7	Nov. 23 to Dec. 11
Feb. 15 to Feb. 28	-33.6	Nov. 9 to Nov. 22
Mar. 1 to Mar. 12	-33.5	Oct. 28 to Nov. 8
Mar. 13 to Mar. 23	-33.4	Oct. 17 to Oct. 27
Mar. 24 to Apr. 3	-33.3	Oct. 6 to Oct. 16
Apr. 4 to Apr. 14	-33.2	Sept. 25 to Oct. 5
Apr. 15 to Apr. 26	-33.1	Sept. 13 to Sept. 24
Apr. 27 to May 8	-33.0	Sept. 1 to Sept. 12
May 9 to May 23	-32.9	Aug. 17 to Aug. 31
May 24 to June 15	-32.8	July 25 to Aug. 16
June 16 to July 24	-32.7	

If the center of the Sun or Moon is observed with a bubble sextant, calculate the correction for the two limbs separately, and take the average of the two results; in the case of the Sun, add 0.'6 to this average. Do not apply correction for height of eye to bubble sextant observations.

5. *Latitude from Polaris.* The tables on the last white page and the first yellow page give three corrections which must be applied to a corrected altitude of Polaris to get the latitude. All three tables depend on the local hour angle of the vernal equinox. The second table depends also on the date and the third on the corrected altitude.

Example: On 1955 January 8, 13^h 45^m 35^s GMT in longitude 74° West the observed altitude of Polaris was 40° 13.'2. Find the latitude.

(From the daily page for Jan. 7, 8, 9) GHA Υ , Jan. 8, 13 ^h	302 18.3
(From yellow table 45 ^m , Υ , 35 ^a) 45 ^m 35 ^a	11 25.6
GHA Υ	313 43.9
Longitude west (subtract)	74 00.0
LHA Υ	239 43.9
Corrected altitude (from example of section 4)	40 06.5
Correction for LHA Υ , 239 ^o .7	+48.3
Correction for LHA Υ and date	- 0.1
Correction for LHA Υ and corrected altitude	0.0
Latitude	40 54.7

The page preceding the other Polaris tables gives the azimuth, depending on LHA Υ and the latitude.

6. *Sunrise, sunset, twilight, moonrise, moonset.* Data for finding these for latitudes between 60° south and 72° north are given on the right-hand daily pages. Sunrise, sunset, and the beginning and ending of astronomical twilight are given for the middle day; they are sufficiently accurate for three days. Moonrise and moonset are given for four days for the Greenwich meridian in order to facilitate estimation of times for other longitudes. All times in these columns are local mean times. The precise time of moonrise or moonset is seldom needed; a glance at the table will usually show whether the Moon is up, and favorably placed for observation. If needed, however, the precise time may be obtained as follows. Interpolate for latitude on the day wanted, and also on the preceding day in east longitudes, or the following day in west longitudes. Take the difference between the two results, multiply it by the longitude divided by 360°, and apply the product to the datum for the day wanted, so as to bring the result between the two results previously found.

Example: Find the time of moonrise on 1955 January 3, in longitude 60° west, latitude 42° north.

January 3, Greenwich, latitude 42° north	12 ^h 07 ^m
January 4, Greenwich, latitude 42° north	12 47
Difference	40
Correction for longitude, $\frac{60}{360} \times 40$	07
Local mean time of moonrise	12 14
GMT of moonrise (60°=4 ^h)	16 14

The times of moonrise and moonset are sometimes greater than 24^h. This means that the phenomenon really occurs on the following day but the time is given in this form to facilitate the interpolation. For any given meridian the time of moonrise or moonset is about an hour later (on the average) each succeeding day. If then, on a given day, one of these phenomena occurs shortly before midnight, the next one will occur about 25 hours later which carries it over into the second day.

Some of the phenomena do not occur in high latitudes during certain periods. The symbols used to indicate the exceptions are:

□, Sun or Moon does not set but remains continuously above the horizon.

■, Sun or Moon does not rise but remains continuously below the horizon.

////, Twilight lasts all night.

7. *Equation of time.* This is given on the right-hand daily pages, at intervals of 6 hours. It is to be applied to mean time in order to obtain apparent time.

8. *Meridian transit of Moon and planets.* The GMT of transit of the Moon and planets over the meridian of Greenwich is given for every day on the right-hand daily pages. The LMT of transit over another meridian may be obtained as described for moonrise in section 6.

9. *Accuracy.* Although the quantities in this volume are given to tenths of minutes, in general the GHA and Dec. of an object cannot actually be obtained accurate to 0'.1. The chief reason for loss of accuracy is the error of rounding off; any quantity given to 0'.1 is necessarily subject to an error that may be as large as 0'.05. When several such quantities are added together the errors of rounding may accumulate.

In general, the largest error that can occur in a GHA or Dec. taken from this volume is about 0'.2. In practice it may be expected that two-thirds of the quantities taken out will have errors less than 0'.1, and one-third will have errors between 0'.1 and 0'.2.

In the case of the Sun's GHA the error will on occasions be 0'.1 greater than the figures just given, owing to neglecting the code. This last error has been minimized by adjusting the printed GHA in such a way as to spread the error through the hour.

10. *Using the 1955 Almanac in 1956.* This volume may be used in 1956 for the Sun and stars, with errors generally less than 0'.4, in the following way.

Calculate the GHA of a star for the same date and time and subtract 15'.1 in January and February, add 44'.0 in March through December. Take out the Dec. of a star for the same date. (On February 29 use the GHA and Dec. for March 1 and subtract 15'.1 from the GHA.)

For the Sun's GHA use the same date and time and apply the correction from the table on page 253.

For an observation of the Sun made before 5^h 49^m GMT on February 29 take out the Sun's Dec. for a time 5^h 49^m earlier than the time of the observation. For succeeding observations take out the Sun's Dec. for a time 18^h 11^m later than the time of the observation.

11. *Right ascension.* The right ascensions of objects are not needed in navigation. They may, however, be obtained if desired from the data in this volume.

The right ascension of a star is obtained by subtracting the SHA from 360°, and converting from arc to time by the table on page 260.

Example: Find the right ascension of star 12 Capella on 1955 January 3.

		360 00.0
(From daily page for Jan. 1, 2, 3) SHA		281 38.7
Difference		78 21.3
78°	5 ^h 12 ^m 00 ^s .0	
21'	1 24.0	
0'.3 or 18''	1.2	
right ascension	5 ^h 13 ^m 25 ^s .2	

The right ascension of the Sun, Moon, or a planet may be obtained by subtracting the GHA of the object from GHA Υ , and converting from arc to time.

Example: Find the right ascension of the Moon on 1955, January 3, 14^h 14^m 27^s GMT.

	Υ	Moon	Code
(From the daily page for Jan. 1, 2, 3) Jan. 3, 14 ^h	312 25.1	281 11.3	+75
(From the yellow table 14 ^m , 27 ^s) 14 ^m 27 ^s	3 37.3	3 26.9	
(From yellow table 14 ^m , code 75) code correction		1.8	
GHA	316 02.4	284 40.0	
Difference	31 22.4		
31°	2 ^h 04 ^m 00 ^s .0		
22'	1 28.0		
0'.4 or 24''	01.6		
Right ascension	2 ^h 05 ^m 29 ^s .6		

SUN'S GHA IN 1956

Apply to 1955 value to obtain 1956 value for same date and GMT.

Jan.	4 +2.0	Apr.	13 +2.8	June	2 -1.5	Aug.	1 +0.9	Oct.	9 +2.9	Nov.	11 -1.6
	8 +1.8		16 +2.6		4 -1.7		3 +1.1		11 +2.7		12 -1.7
	10 +1.6		19 +2.4		6 -1.9		6 +1.3		14 +2.5		13 -1.8
	13 +1.4		23 +2.2		8 -2.1		9 +1.5		16 +2.3		14 -2.0
	16 +1.2		27 +2.0		11 -2.3		11 +1.7		19 +2.1		16 -2.2
	22 +1.0		30 +1.8		19 -2.5		13 +1.9		21 +1.9		18 -2.4
Feb.	2 +0.8	May	2 +1.6		23 -2.3		15 +2.1		23 +1.7		19 -2.6
	5 +0.6		3 +1.4		26 -2.1		16 +2.3		25 +1.5		21 -2.8
	7 +0.4		5 +1.2	July	1 -1.9		18 +2.5		26 +1.3		22 -2.9
	9 +0.2		6 +1.1		9 -1.7		19 +2.6		27 +1.2		23 -3.1
	12 0.0		7 +0.9		12 -1.5		20 +2.8		28 +1.0		24 -3.2
	15 -0.2		8 +0.8		15 -1.3		22 +3.0		29 +0.8		25 -3.4
	19 -0.4		9 +0.6		16 -1.2		24 +3.2		30 +0.6		26 -3.5
	28 -0.5		10 +0.5		17 -1.0		26 +3.4		31 +0.5		27 -3.7
Mar.	1 +2.4		11 +0.3		19 -0.8		29 +3.6		1 +0.3		28 -3.9
	3 +2.6		12 +0.2		20 -0.6	Sept.	11 +3.8	Nov.	2 +0.1		29 -4.1
	7 +2.8		13 0.0		21 -0.5		17 +4.0		3 -0.1		30 -4.2
	15 +3.0		15 -0.2		22 -0.3		26 +4.1		4 -0.3	Dec.	1 -4.4
	21 +3.2		17 -0.4		23 -0.2		28 +4.0		5 -0.5		2 -4.6
	25 +3.4		19 -0.6		24 0.0	Oct.	1 +3.8		6 -0.7		3 -4.8
Apr.	2 +3.6		23 -0.8		25 +0.1		3 +3.6		7 -0.9		4 -4.9
	6 +3.4		25 -0.9		26 +0.3		4 +3.4		8 -1.1		5 -5.1
	9 +3.2		28 -1.1		28 +0.5		6 +3.2		9 -1.2		7 -5.3
	11 +3.0		31 -1.3		30 +0.7		8 +3.0		10 -1.4		9 -5.5
	13 +2.8	June	2 -1.5	Aug.	1 +0.9		9 +2.9		11 -1.6		32 -5.7

For a date given in the table, use the upper of the two possible values.

For February 29 apply -0'.5 to the GHA given for March 1.

Mag.	Name and No.	SHA							Declination							
			Jan.	Feb.	Mar.	Apr.	May	June		Jan.	Feb.	Mar.	Apr.	May	June	
2.2	Alpheratz	1	358	29.0	29.1	29.1	29.0	28.8	28.6	+28	50.8	50.7	50.6	50.6	50.6	50.6
2.4	β Cassiopeiae		358	18.5	18.7	18.8	18.7	18.4	18.0	+58	54.5	54.4	54.2	54.1	54.1	54.1
2.9	γ Pegasi		357	16.1	16.2	16.2	16.1	15.9	15.7	+14	56.2	56.1	56.1	56.1	56.1	56.2
2.9	β Hydri §		354	08.9	09.4	09.7	09.6	09.2	08.5	-77	30.6	30.5	30.4	30.2	30.0	29.9
2.4	Ankaa	2	353	58.9	59.0	59.0	59.0	58.8	58.6	-42	33.1	33.1	33.0	32.8	32.7	32.5
2.5	Schedar	3	350	30.7	30.9	31.0	31.0	30.7	30.4	+56	17.8	17.7	17.6	17.5	17.4	17.4
2.2	Diphda	4	349	39.8	39.9	39.9	39.9	39.8	39.5	-18	14.0	14.0	14.0	13.9	13.8	13.7
Var.*	γ Cassiopeiae		346	30.2	30.4	30.5	30.5	30.2	29.9	+60	28.8	28.7	28.6	28.5	28.4	28.4
2.4	β Andromedae		343	11.7	11.8	11.8	11.8	11.7	11.4	+35	23.2	23.2	23.1	23.0	23.0	23.0
2.8	δ Cassiopeiae		339	16.9	17.1	17.3	17.3	17.1	16.7	+60	00.5	00.5	00.4	00.2	00.1	00.1
0.6	Achernar	5	335	59.1	59.4	59.6	59.6	59.5	59.3	-57	28.1	28.0	27.9	27.8	27.6	27.4
2.7	β Arietis		331	57.4	57.5	57.6	57.6	57.5	57.3	+20	35.5	35.5	35.4	35.4	35.4	35.4
2.1	Polaris		331	52.1	61.3	68.4	70.8	67.7	60.0	+89	03.7	03.6	03.5	03.4	03.2	03.2
3.0	α Hydri		330	39.4	39.7	40.0	40.1	40.0	39.8	-61	47.5	47.5	47.3	47.2	47.0	46.8
2.2	γ Andromedæ		329	42.7	42.8	42.9	43.0	42.9	42.6	+42	07.2	07.2	07.1	07.0	06.9	06.9
2.2	Hamal	6	328	50.2	50.3	50.4	50.4	50.3	50.1	+23	15.2	15.2	15.1	15.1	15.1	15.1
3.1	β Trianguli		328	16.7	16.9	17.0	17.0	16.9	16.7	+34	46.8	46.8	46.7	46.6	46.6	46.6
3.1	Acamar	7	315	51.3	51.5	51.6	51.7	51.7	51.6	-40	29.2	29.2	29.2	29.1	28.9	28.7
2.8	Menkar	8	315	00.7	00.8	00.9	01.0	00.9	00.8	+3	54.9	54.9	54.9	54.9	54.9	55.0
Var.†	β Persei		313	41.0	41.1	41.3	41.3	41.3	41.1	+40	47.3	47.3	47.2	47.2	47.1	47.1
1.9	Mirfak	9	309	42.9	43.0	43.2	43.3	43.3	43.1	+49	42.4	42.5	42.4	42.3	42.2	42.2
3.0	η Tauri		303	47.4	47.5	47.6	47.7	47.7	47.6	+23	58.2	58.2	58.2	58.1	58.1	58.1
2.9	ζ Persei		302	09.9	10.1	10.2	10.3	10.3	10.1	+31	45.3	45.3	45.2	45.2	45.2	45.1
3.0	ϵ Persei		301	17.0	17.1	17.2	17.3	17.3	17.2	+39	53.1	53.1	53.1	53.0	53.0	52.9
3.2	γ Eridani		301	00.6	00.7	00.8	00.9	00.9	00.8	-13	38.2	38.2	38.2	38.2	38.1	38.0
1.1	Aldebaran	10	291	39.4	39.5	39.6	39.7	39.7	39.6	+16	25.3	25.3	25.3	25.3	25.2	25.3
2.9	ι Aurigæ §		286	28.4	28.5	28.7	28.8	28.8	28.7	+33	05.9	05.9	05.9	05.9	05.9	05.8
2.9	β Eridani		283	34.9	35.0	35.1	35.2	35.3	35.2	-5	08.6	08.7	08.7	08.7	08.6	08.5
0.3	Rigel	11	281	53.8	53.9	54.0	54.2	54.2	54.2	-8	15.2	15.2	15.3	15.2	15.2	15.1
0.2	Capella	12	281	38.8	38.9	39.0	39.2	39.3	39.2	+45	57.4	57.4	57.5	57.4	57.3	57.3
1.7	Bellatrix	13	279	18.7	18.7	18.8	19.0	19.0	19.0	+6	18.6	18.6	18.6	18.6	18.6	18.6
1.8	Elnath	14	279	07.6	07.7	07.8	08.0	08.0	08.0	+28	34.3	34.4	34.4	34.3	34.3	34.3
3.0	β Leporis		278	24.7	24.8	24.9	25.1	25.1	25.1	-20	47.7	47.8	47.8	47.8	47.7	47.6
2.5	δ Orionis		277	33.8	33.9	34.0	34.1	34.2	34.1	-0	19.9	19.9	19.9	19.9	19.9	19.8
2.7	α Leporis		277	18.3	18.4	18.5	18.6	18.7	18.7	-17	51.3	51.3	51.4	51.4	51.3	51.2
2.9	ι Orionis		276	41.0	41.0	41.2	41.3	41.3	41.3	-5	56.3	56.4	56.4	56.4	56.3	56.3
1.8	Alnilam	15	276	30.5	30.5	30.7	30.8	30.8	30.8	-1	13.8	13.8	13.9	13.8	13.8	13.7
3.0	ζ Tauri		276	15.0	15.1	15.2	15.3	15.4	15.4	+21	07.0	07.0	07.0	07.0	07.0	07.0
2.8	α Columbæ		275	29.2	29.3	29.4	29.6	29.7	29.7	-34	05.9	06.0	06.1	06.0	06.0	05.8
1.9	ζ Orionis		275	22.1	22.2	22.3	22.4	22.5	22.4	-1	57.9	58.0	58.0	58.0	58.0	57.9
2.2	κ Orionis		273	35.1	35.2	35.3	35.4	35.5	35.5	-9	41.1	41.2	41.2	41.2	41.1	41.1
Var.†	Betelgeuse	16	271	48.4	48.4	48.5	48.6	48.7	48.7	+7	24.0	24.0	24.0	24.0	24.0	24.0
2.1	β Aurigæ		270	55.7	55.8	56.0	56.1	56.2	56.2	+44	56.8	56.8	56.8	56.8	56.8	56.7
2.7	θ Aurigæ		270	49.4	49.5	49.6	49.8	49.9	49.8	+37	12.7	12.8	12.8	12.8	12.7	12.7
2.0	β Canis Majoris		264	48.6	48.7	48.8	49.0	49.1	49.1	-17	56.0	56.1	56.2	56.2	56.1	56.0
-0.9	Canopus	17	264	15.1	15.2	15.4	15.7	15.9	16.0	-52	40.3	40.5	40.5	40.5	40.5	40.3
1.9	γ Geminorum		261	12.6	12.7	12.8	12.9	13.0	13.0	+16	26.3	26.3	26.3	26.3	26.3	26.3
-1.6	Sirius	18	259	11.9	12.0	12.1	12.2	12.3	12.4	-16	39.3	39.4	39.4	39.4	39.4	39.3
2.8	τ Puppis		257	47.1	47.2	47.4	47.6	47.8	47.9	-50	33.7	33.9	34.0	34.0	33.9	33.8
1.6	Adhara	19	255	46.5	46.6	46.7	46.9	47.0	47.1	-28	54.7	54.8	54.9	54.9	54.8	54.7
3.1	$\circ$ Canis Majoris		254	42.2	42.3	42.4	42.5	42.6	42.7	-23	46.1	46.2	46.3	46.3	46.2	46.1
2.0	δ Canis Majoris		253	21.0	21.0	21.1	21.3	21.4	21.5	-26	19.3	19.5	19.5	19.5	19.5	19.4
2.7	π Puppis		251	06.1	06.1	06.3	06.4	06.6	06.7	-37	01.0	01.2	01.3	01.3	01.2	01.1
2.4	η Canis Majoris		249	24.7	24.7	24.8	25.0	25.1	25.2	-29	13.0	13.1	13.2	13.2	13.1	13.0
3.1	β Canis Minoris		248	48.7	48.7	48.8	48.9	49.0	49.0	+8	22.8	22.8	22.7	22.7	22.8	22.8
3.3	σ Puppis		248	02.3	02.4	02.5	02.7	02.9	03.0	-43	12.7	12.8	12.9	12.9	12.9	12.8
1.6	α Geminorum		247	03.3	03.3	03.3	03.5	03.6	03.6	+31	59.3	59.3	59.3	59.3	59.3	59.3

*Irregular variable; 1950 Mag. 2.5.

†2.3-3.5.

‡0.1-1.2.

§Not suitable for use with H. O. 214.

Mag.	Name and No.	SHA							Declination						
			July	Aug.	Sept.	Oct.	Nov.	Dec.		July	Aug.	Sept.	Oct.	Nov.	Dec.
2.2	Alpheratz	1	358	28.3	28.1	28.0	28.0	28.1	+28	50.7	50.8	51.0	51.1	51.1	51.1
2.4	β Cassiopeia		358	17.6	17.3	17.1	17.1	17.2	+58	54.2	54.3	54.5	54.6	54.8	54.8
2.9	γ Pegasi		357	15.5	15.3	15.1	15.1	15.2	+14	56.3	56.4	56.5	56.5	56.6	56.5
2.9	β Hydri §		354	07.7	07.0	06.6	06.6	07.0	-77	29.8	29.9	30.0	30.2	30.3	30.3
2.4	Ankaa	2	353	58.3	58.0	57.9	57.8	57.9	-42	32.5	32.4	32.5	32.6	32.7	32.8
2.5	Schedar	3	350	30.0	29.7	29.5	29.4	29.6	+56	17.5	17.6	17.8	18.0	18.1	18.2
2.2	Diphda	4	349	39.3	39.1	38.9	38.9	39.0	-18	13.6	13.5	13.5	13.5	13.6	13.7
Var.*	γ Cassiopeia		346	29.5	29.1	28.8	28.7	28.8	+60	28.4	28.6	28.7	28.9	29.0	29.1
2.4	β Andromedæ		343	11.1	10.9	10.7	10.6	10.7	+35	23.1	23.2	23.3	23.4	23.5	23.5
2.8	δ Cassiopeia		339	16.3	15.9	15.6	15.5	15.6	+60	00.1	00.2	00.4	00.5	00.7	00.8
0.6	Achernar	5	335	58.9	58.6	58.3	58.2	58.4	-57	27.3	27.3	27.4	27.5	27.6	27.8
2.7	β Arietis		331	57.1	56.8	56.6	56.5	56.5	+20	35.5	35.6	35.7	35.8	35.8	35.8
2.1	Polaris		331	49.9	49.3	49.0	48.9	49.0	+89	03.1	03.2	03.3	03.5	03.7	03.8
3.0	α Hydri		330	39.4	39.0	38.7	38.6	38.8	-61	46.7	46.7	46.8	46.9	47.1	47.2
2.2	γ Andromedæ		329	42.3	42.0	41.8	41.6	41.6	+42	07.0	07.0	07.2	07.3	07.4	07.4
2.2	Hamal	6	328	49.8	49.6	49.4	49.3	49.2	+23	15.2	15.3	15.4	15.4	15.5	15.5
3.1	β Trianguli		328	16.4	16.1	15.9	15.8	15.7	+34	46.6	46.7	46.8	46.9	47.0	47.0
3.1	Acamar	7	315	51.4	51.1	50.9	50.7	50.6	-40	28.6	28.5	28.5	28.6	28.8	28.9
2.8	Menkar	8	314	60.6	60.3	60.1	60.0	59.9	+3	55.1	55.2	55.2	55.2	55.2	55.2
Var.†	β Persei		313	40.8	40.5	40.3	40.0	39.9	+40	47.1	47.1	47.2	47.3	47.4	47.4
1.9	Mirfak	9	309	42.8	42.5	42.1	41.9	41.7	+49	42.2	42.2	42.3	42.4	42.5	42.6
3.0	η Tauri		303	47.3	47.1	46.8	46.6	46.5	+23	58.1	58.2	58.2	58.3	58.3	58.3
2.9	ζ Persei		302	09.9	09.7	09.4	09.2	09.0	+31	45.1	45.2	45.2	45.3	45.3	45.4
3.0	ϵ Persei		301	17.0	16.7	16.4	16.1	16.0	+39	52.9	52.9	53.0	53.1	53.1	53.2
3.2	γ Eridani		300	60.7	60.4	60.2	60.0	59.9	-13	37.9	37.8	37.7	37.8	37.9	38.0
1.1	Aldebaran	10	291	39.5	39.2	39.0	38.8	38.6	+16	25.3	25.4	25.4	25.4	25.4	25.4
2.9	ι Aurigæ §		286	28.6	28.3	28.0	27.8	27.6	+33	05.8	05.8	05.8	05.9	05.9	05.9
2.9	β Eridani		283	35.1	34.9	34.7	34.5	34.3	-5	08.5	08.4	08.4	08.4	08.4	08.5
0.3	Rigel	11	281	54.0	53.8	53.6	53.4	53.2	-8	15.0	14.9	14.9	14.9	15.0	15.1
0.2	Capella	12	281	39.0	38.7	38.4	38.1	37.8	+45	57.2	57.2	57.2	57.2	57.3	57.3
1.7	Bellatrix	13	279	18.8	18.6	18.4	18.2	18.0	+6	18.7	18.7	18.8	18.8	18.7	18.7
1.8	El Nath	14	279	07.8	07.6	07.3	07.1	06.9	+28	34.3	34.3	34.3	34.3	34.3	34.3
3.0	β Leporis		278	25.0	24.8	24.6	24.4	24.2	-20	47.5	47.4	47.4	47.4	47.5	47.6
2.5	δ Orionis		277	34.0	33.8	33.6	33.4	33.2	-0	19.8	19.7	19.7	19.7	19.7	19.8
2.7	α Leporis		277	18.6	18.4	18.2	17.9	17.7	-17	51.1	51.0	50.9	51.0	51.0	51.2
2.9	ι Orionis		276	41.2	41.0	40.8	40.6	40.4	-5	56.2	56.1	56.1	56.1	56.2	56.3
1.8	Alnilam	15	276	30.7	30.5	30.3	30.1	29.9	-1	13.7	13.6	13.6	13.6	13.6	13.7
3.0	ζ Tauri		276	15.2	15.0	14.8	14.5	14.3	+21	07.0	07.0	07.1	07.1	07.0	07.0
2.8	α Columbæ		275	29.6	29.4	29.2	28.9	28.7	-34	05.7	05.6	05.5	05.5	05.7	05.8
1.9	ζ Orionis		275	22.3	22.1	21.9	21.7	21.5	-1	57.8	57.8	57.7	57.7	57.8	57.9
2.2	κ Orionis		273	35.4	35.2	35.0	34.7	34.6	-9	41.0	40.9	40.9	40.9	41.0	41.1
Var.†	Betelgeuse	16	271	48.6	48.4	48.2	47.9	47.7	+7	24.1	24.1	24.1	24.1	24.1	24.0
2.1	β Aurigæ		270	56.1	55.8	55.5	55.2	54.9	+44	56.6	56.6	56.6	56.6	56.6	56.7
2.7	θ Aurigæ		270	49.7	49.5	49.2	48.9	48.7	+37	12.6	12.6	12.6	12.6	12.6	12.6
2.0	β Canis Majoris		264	49.0	48.8	48.6	48.4	48.2	-17	55.9	55.8	55.8	55.8	55.9	56.0
-0.9	Canopus	17	264	16.0	15.8	15.5	15.2	14.9	-52	40.2	40.0	39.9	40.0	40.1	40.2
1.9	γ Geminorum		261	12.9	12.7	12.5	12.3	12.0	+16	26.3	26.3	26.3	26.3	26.3	26.2
-1.6	Sirius	18	259	12.3	12.1	12.0	11.7	11.5	-16	39.2	39.1	39.1	39.1	39.2	39.3
2.8	τ Puppis		257	47.9	47.8	47.5	47.2	46.9	-50	33.6	33.5	33.4	33.4	33.5	33.7
1.6	Adhara	19	255	47.0	46.9	46.7	46.4	46.2	-28	54.6	54.5	54.4	54.4	54.5	54.7
3.1	$\circ$ Canis Majoris		254	42.6	42.5	42.3	42.1	41.9	-23	46.0	45.9	45.8	45.9	45.9	46.1
2.0	δ Canis Majoris		253	21.4	21.3	21.1	20.9	20.6	-26	19.3	19.2	19.1	19.1	19.2	19.3
2.7	π Puppis		251	06.7	06.5	06.3	06.1	05.8	-37	01.0	00.9	00.8	00.8	00.9	01.0
2.4	η Canis Majoris		249	25.1	25.0	24.8	24.6	24.4	-29	12.9	12.8	12.7	12.7	12.8	13.0
3.1	β Canis Minoris		248	49.0	48.8	48.6	48.4	48.2	+8	22.8	22.8	22.8	22.8	22.8	22.7
3.3	σ Puppis		248	03.0	02.9	02.7	02.4	02.2	-43	12.7	12.5	12.4	12.4	12.5	12.6
1.6	α Geminorum		247	03.6	03.4	03.2	03.0	02.7	+31	59.3	59.2	59.2	59.1	59.1	59.1

*Irregular variable; 1950 Mag. 2.5.

†2.3-3.5.

‡0.1-1.2.

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Mag.	Name and No.	S.A.						Declination							
			Jan.	Feb.	Mar.	Apr.	May	June		Jan.	Feb.	Mar.	Apr.	May	June
0.5	Procyon 20	245	45.2	45.1	45.2	45.3	45.5	45.5	+ 5	20.4	20.3	20.3	20.3	20.3	20.4
1.2	Pollux 21	244	20.8	20.8	20.8	21.0	21.1	21.1	+28	08.1	08.1	08.1	08.2	08.2	08.1
2.3	ζ Puppis 239	239	29.3	29.3	29.5	29.6	29.8	29.9	-39	52.6	52.8	52.9	52.9	52.9	52.8
2.9	ρ Puppis 238	238	35.0	35.0	35.0	35.2	35.3	35.4	-24	10.5	10.6	10.7	10.7	10.7	10.6
1.9	γ Velorum 237	237	57.2	57.2	57.3	57.5	57.7	57.8	-47	12.3	12.4	12.5	12.6	12.6	12.5
1.7	Avior 22	234	35.4	35.4	35.6	35.8	36.1	36.4	-59	21.9	22.1	22.2	22.3	22.3	22.2
2.0	δ Velorum 229	229	07.4	07.4	07.5	07.7	08.0	08.2	-54	32.6	32.8	32.9	33.0	33.0	33.0
3.1	ι Ursæ Majoris 225	225	57.1	57.0	57.0	57.2	57.4	57.5	+48	13.0	13.0	13.1	13.2	13.2	13.2
2.2	ι Suhail 223	223	24.3	24.2	24.3	24.4	24.6	24.8	-43	15.0	15.2	15.4	15.4	15.5	15.4
1.8	ι Miaplacidus 24	221	48.3	48.3	48.5	48.8	49.3	49.7	-69	31.9	32.1	32.2	32.4	32.4	32.4
2.2	ι Carinæ 221	221	01.0	00.9	01.0	01.2	01.5	01.8	-59	05.2	05.3	05.5	05.6	05.7	05.6
2.6	κ Velorum 219	219	48.5	48.5	48.5	48.7	49.0	49.2	-54	49.1	49.3	49.4	49.5	49.6	49.5
2.2	ι Alphard 218	218	38.8	38.7	38.7	38.8	38.9	39.0	- 8	27.9	28.0	28.1	28.1	28.1	28.0
3.0	N Velorum 217	217	31.5	31.4	31.5	31.7	31.9	32.2	-56	50.1	50.3	50.5	50.6	50.6	50.6
3.1	ε Leonis 214	214	09.8	09.7	09.7	09.8	09.9	10.0	+23	58.7	58.7	58.7	58.8	58.8	58.8
1.3	Regulus 26	208	29.8	29.6	29.6	29.7	29.8	29.9	+12	11.1	11.0	11.0	11.0	11.1	11.1
2.3	γ Leonis 205	205	37.0	36.8	36.8	36.9	37.0	37.1	+20	03.9	03.9	03.9	04.0	04.0	04.0
3.0	θ Carinæ § 199	199	39.1	38.9	38.8	39.0	39.3	39.5	-64	09.4	09.6	09.8	09.9	10.0	10.0
2.8	μ Velorum 198	198	47.0	46.8	46.8	46.8	47.0	47.2	-49	10.9	11.1	11.2	11.4	11.4	11.4
2.4	β Ursæ Majoris 195	195	12.2	11.9	11.8	11.9	12.1	12.3	+56	37.1	37.1	37.2	37.4	37.4	37.5
2.0	Dubhe 27	194	44.7	44.4	44.3	44.4	44.6	44.9	+61	59.3	59.3	59.5	59.6	59.7	59.7
3.2	ψ Ursæ Majoris 193	193	12.3	12.1	12.0	12.0	12.2	12.3	+44	44.2	44.3	44.3	44.4	44.5	44.6
2.6	δ Leonis 192	192	03.7	03.5	03.5	03.5	03.6	03.7	+20	46.0	45.9	45.9	46.0	46.0	46.1
2.2	Denebola 28	183	18.1	17.9	17.8	17.8	17.8	17.9	+14	49.2	49.1	49.1	49.1	49.2	49.2
2.5	γ Ursæ Majoris 182	182	07.3	07.1	06.9	07.0	07.1	07.3	+53	56.3	56.3	56.4	56.5	56.7	56.7
2.9	δ Centauri 178	178	29.2	29.0	28.9	28.8	28.9	29.1	-50	28.2	28.4	28.5	28.7	28.8	28.8
2.8	Gienah 29	176	37.2	37.1	36.9	36.9	36.9	37.0	-17	17.6	17.7	17.8	17.9	17.9	17.9
1.1	Acrux 30	173	58.2	57.8	57.6	57.6	57.7	57.9	-62	50.9	51.0	51.2	51.4	51.5	51.6
1.6	Gacrux 31	172	49.7	49.3	49.2	49.1	49.2	49.3	-56	51.6	51.7	51.9	52.0	52.2	52.2
2.8	β Corvi 171	171	59.3	59.1	59.0	58.9	58.9	59.0	-23	08.9	09.1	09.2	09.2	09.3	09.3
2.9	α Muscæ 171	22.3	21.8	21.5	21.5	21.6	21.9	-68	53.1	53.3	53.4	53.6	53.8	53.8	
2.4	γ Centauri 170	14.2	13.9	13.7	13.7	13.7	13.8	-48	42.7	42.8	43.0	43.1	43.2	43.3	
2.9	γ Virginis 170	08.9	08.7	08.6	08.6	08.6	08.6	- 1	12.4	12.4	12.5	12.5	12.5	12.5	
1.5	β Crucis 168	43.4	43.0	42.8	42.7	42.8	42.9	-59	26.5	26.6	26.8	26.9	27.0	27.1	
1.7	Alioth 32	166	58.8	58.5	58.3	58.2	58.3	58.5	+56	11.8	11.8	11.9	12.0	12.2	12.2
2.9	α Canum Venat. 166	30.8	30.5	30.3	30.3	30.3	30.4	+38	33.3	33.3	33.3	33.4	33.5	33.6	
3.0	ε Virginis 165	00.6	00.4	00.3	00.2	00.2	00.3	+11	11.8	11.7	11.7	11.7	11.8	11.8	
2.9	ι Centauri 160	28.7	28.5	28.3	28.2	28.2	28.3	-36	28.5	28.6	28.7	28.8	28.9	29.0	
2.2	ζ Ursæ Majoris 159	28.0	27.6	27.4	27.3	27.4	27.5	+55	09.2	09.2	09.2	09.4	09.5	09.6	
1.2	Spica 33	159	17.4	17.2	17.0	16.9	16.9	-10	55.7	55.8	55.9	55.9	56.0	55.9	
2.6	ε Centauri 155	44.3	44.0	43.7	43.6	43.5	43.6	-53	14.2	14.3	14.4	14.6	14.7	14.8	
1.9	Alkaid 34	153	33.2	32.9	32.7	32.6	32.6	32.7	+49	31.8	31.8	31.9	32.0	32.1	32.2
2.8	η Bootis 151	51.6	51.4	51.2	51.1	51.1	51.1	+18	37.1	37.0	37.0	37.1	37.1	37.2	
3.1	ζ Centauri 151	48.9	48.5	48.3	48.2	48.1	48.2	-47	04.0	04.1	04.2	04.3	04.4	04.5	
0.9	Hadar 35	149	50.2	49.8	49.5	49.3	49.2	49.3	-60	09.3	09.4	09.5	09.6	09.8	09.9
2.3	Menkent 36	148	59.3	59.0	58.8	58.7	58.6	58.7	-36	08.9	09.0	09.1	09.2	09.3	09.4
0.2	Arcturus 37	146	35.7	35.4	35.2	35.1	35.1	35.1	+19	24.7	24.6	24.6	24.6	24.7	24.8
3.0	γ Bootis 142	25.9	25.6	25.4	25.2	25.2	25.3	+38	29.9	29.8	29.9	30.0	30.1	30.2	
2.6	η Centauri 141	50.1	49.8	49.6	49.4	49.3	49.3	-41	57.6	57.7	57.8	57.9	58.0	58.1	
0.1	Rigil Kent. 38	140	51.8	51.4	51.1	50.8	50.7	50.8	-60	39.0	39.0	39.1	39.3	39.4	39.5
2.9	α Lupi 140	15.9	15.5	15.3	15.1	15.0	15.0	-47	11.7	11.8	11.9	12.0	12.1	12.2	
2.6	ε Bootis 139	14.5	14.3	14.1	13.9	13.9	13.9	+27	15.5	15.4	15.4	15.5	15.6	15.7	
2.9	Zubenelgenubi 39	137	54.0	53.8	53.6	53.4	53.3	53.3	-15	51.4	51.5	51.6	51.6	51.6	51.6
2.2	Kochab 40	137	18.2	17.6	17.0	16.7	16.7	16.9	+74	19.9	19.9	20.0	20.1	20.3	20.4
2.8	β Lupi 136	06.2	05.9	05.6	05.4	05.3	05.3	-42	57.2	57.2	57.3	57.4	57.5	57.6	
2.7	β Libræ 131	21.1	20.9	20.7	20.5	20.4	20.4	- 9	13.2	13.3	13.3	13.3	13.3	13.3	
3.1	γ Trianguli Aust. 131	19.7	19.1	18.6	18.2	18.0	17.9	-68	30.7	30.8	30.9	31.0	31.1	31.3	

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Mag.	Name and No.		SHA							Declination						
				July	Aug.	Sept.	Oct.	Nov.	Dec.		July	Aug.	Sept.	Oct.	Nov.	Dec.
0.5	Procyon	20	245	45.4	45.3	45.2	44.9	44.7	44.5	+ 5	20.4	20.4	20.4	20.4	20.3	20.3
1.2	Pollux	21	244	21.1	21.0	20.8	20.5	20.3	20.0	+28	08.1	08.1	08.0	08.0	07.9	07.9
2.3	♄ Puppis		239	29.9	29.9	29.7	29.4	29.2	28.9	-39	52.7	52.5	52.5	52.4	52.5	52.6
2.9	♅ Puppis		238	35.4	35.3	35.1	34.9	34.7	34.5	-24	10.5	10.4	10.4	10.4	10.4	10.6
1.9	γ Velorum		237	57.9	57.8	57.6	57.4	57.1	56.8	-47	12.4	12.2	12.1	12.1	12.1	12.3
1.7	Avior	22	234	36.5	36.4	36.2	35.9	35.5	35.2	-59	22.1	21.9	21.8	21.7	21.8	21.9
2.0	δ Velorum		229	08.2	08.2	08.1	07.8	07.4	07.1	-54	32.8	32.7	32.6	32.5	32.5	32.7
3.1	ε Ursæ Majoris		225	57.5	57.4	57.3	57.0	56.7	56.3	+48	13.1	13.0	12.9	12.8	12.7	12.7
2.2	Suhail	23	223	24.8	24.8	24.7	24.5	24.2	23.9	-43	15.3	15.2	15.0	15.0	15.0	15.1
1.8	Miaplacidus	24	221	49.9	50.0	49.8	49.4	48.9	48.4	-69	32.3	32.1	32.0	31.9	31.9	32.0
2.2	ε Carinæ		221	01.9	01.9	01.8	01.5	01.1	00.8	-59	05.5	05.3	05.2	05.1	05.1	05.3
2.6	κ Velorum		219	49.3	49.3	49.2	48.9	48.6	48.2	-54	49.4	49.3	49.1	49.1	49.1	49.2
2.2	Alphard	25	218	39.0	39.0	38.9	38.7	38.5	38.2	- 8	28.0	27.9	27.9	27.9	28.0	28.1
3.0	N Velorum		217	32.3	32.3	32.2	32.0	31.6	31.2	-56	50.5	50.3	50.2	50.1	50.1	50.2
3.1	ε Leonis		214	10.0	10.0	09.9	09.7	09.5	09.2	+23	58.8	58.8	58.7	58.6	58.5	58.5
1.3	Regulus	26	208	29.9	29.9	29.8	29.7	29.4	29.2	+12	11.1	11.1	11.1	11.0	10.9	10.8
2.3	γ Leonis		205	37.1	37.1	37.0	36.9	36.7	36.4	+20	04.0	04.0	04.0	03.9	03.8	03.7
3.0	θ Carinæ §		199	39.8	39.9	39.9	39.7	39.3	38.8	-64	10.0	09.9	09.7	09.6	09.6	09.6
2.8	μ Velorum		198	47.3	47.4	47.4	47.2	46.9	46.6	-49	11.4	11.2	11.1	11.0	11.0	11.1
2.4	β Ursæ Majoris		195	12.5	12.6	12.6	12.4	12.1	11.7	+56	37.4	37.3	37.1	37.0	36.8	36.7
2.0	Dubhe	27	194	45.1	45.2	45.2	45.0	44.7	44.3	+61	59.6	59.5	59.3	59.2	59.0	58.9
3.2	ψ Ursæ Majoris		193	12.4	12.5	12.5	12.3	12.1	11.8	+44	44.5	44.4	44.3	44.2	44.0	43.9
2.6	δ Leonis		192	03.7	03.8	03.7	03.6	03.4	03.2	+20	46.1	46.1	46.0	45.9	45.8	45.7
2.2	Denebola	28	183	18.0	18.0	18.0	18.0	17.8	17.6	+14	49.2	49.2	49.2	49.1	49.0	48.9
2.5	γ Ursæ Majoris		182	07.5	07.6	07.6	07.6	07.3	07.0	+53	56.7	56.6	56.5	56.3	56.1	56.0
2.9	δ Centauri		178	29.2	29.3	29.4	29.3	29.1	28.8	-50	28.8	28.7	28.6	28.5	28.4	28.5
2.8	Gienah	29	176	37.1	37.2	37.2	37.1	37.0	36.7	-17	17.9	17.8	17.8	17.7	17.8	17.8
1.1	Acrux	30	173	58.1	58.4	58.5	58.4	58.2	57.7	-62	51.6	51.5	51.4	51.2	51.1	51.1
1.6	Gacrux	31	172	49.5	49.7	49.8	49.8	49.5	49.2	-56	52.2	52.1	52.0	51.9	51.8	51.8
2.8	β Corvi		171	59.1	59.2	59.2	59.2	59.0	58.8	-23	09.3	09.2	09.1	09.1	09.1	09.2
2.9	α Muscæ		171	22.2	22.5	22.7	22.7	22.3	21.8	-68	53.8	53.8	53.6	53.5	53.4	53.4
2.4	γ Centauri		170	14.0	14.1	14.2	14.2	14.0	13.7	-48	43.3	43.2	43.1	43.0	42.9	42.9
2.9	γ Virginis		170	08.7	08.8	08.8	08.8	08.7	08.4	- 1	12.4	12.4	12.4	12.4	12.5	12.6
1.5	β Crucis		168	43.2	43.4	43.5	43.5	43.2	42.9	-59	27.1	27.1	26.9	26.8	26.7	26.7
1.7	Alioth	32	166	58.7	58.9	59.0	59.0	58.9	58.6	+56	12.2	12.2	12.1	11.9	11.7	11.6
2.9	α Canum Venat.		166	30.6	30.7	30.8	30.8	30.6	30.4	+38	33.6	33.6	33.5	33.4	33.2	33.1
3.0	ε Virginis		165	00.3	00.4	00.5	00.5	00.3	00.1	+11	11.9	11.9	11.9	11.8	11.7	11.6
2.9	ε Centauri		160	28.4	28.5	28.6	28.6	28.4	28.2	-36	29.0	28.9	28.8	28.8	28.7	28.7
2.2	♄ Ursæ Majoris		159	27.7	28.0	28.1	28.2	28.1	27.8	+55	09.6	09.6	09.5	09.3	09.1	09.0
1.2	Spica	33	159	17.0	17.1	17.2	17.2	17.1	16.9	-10	55.9	55.9	55.8	55.8	55.9	55.9
2.6	ε Centauri		155	43.8	43.9	44.1	44.1	44.0	43.7	-53	14.8	14.8	14.7	14.5	14.5	14.4
1.9	Alkaid	34	153	32.9	33.1	33.3	33.3	33.2	33.0	+49	32.3	32.2	32.2	32.0	31.8	31.7
2.8	η Bootis		151	51.2	51.3	51.4	51.4	51.4	51.2	+18	37.3	37.3	37.2	37.2	37.0	36.9
3.1	♄ Centauri		151	48.3	48.4	48.6	48.6	48.5	48.2	-47	04.5	04.5	04.4	04.3	04.2	04.2
0.9	Hadar	35	149	49.5	49.7	49.9	50.0	49.9	49.5	-60	09.9	09.9	09.8	09.7	09.6	09.5
2.3	Menkent	36	148	58.7	58.9	59.0	59.0	58.9	58.7	-36	09.4	09.3	09.3	09.2	09.2	09.2
0.2	Arcturus	37	146	35.2	35.3	35.4	35.5	35.4	35.2	+19	24.9	24.9	24.8	24.8	24.7	24.5
3.0	γ Bootis		142	25.4	25.5	25.7	25.8	25.7	25.6	+38	30.3	30.3	30.2	30.1	30.0	29.8
2.6	η Centauri		141	49.4	49.6	49.7	49.8	49.7	49.5	-41	58.1	58.1	58.0	57.9	57.8	57.8
0.1	Rigel Kent.	38	140	51.0	51.2	51.4	51.6	51.5	51.2	-60	39.6	39.6	39.5	39.4	39.2	39.2
2.9	α Lupi		140	15.1	15.2	15.4	15.5	15.4	15.2	-47	12.2	12.2	12.1	12.0	11.9	11.9
2.6	ε Bootis		139	14.0	14.1	14.2	14.3	14.3	14.1	+27	15.8	15.8	15.7	15.7	15.5	15.4
2.9	Zubenelgenubi	39	137	53.4	53.5	53.6	53.6	53.6	53.4	-15	51.6	51.6	51.5	51.5	51.5	51.6
2.2	Kochab	40	137	17.4	18.0	18.6	19.0	19.1	18.9	+74	20.5	20.5	20.4	20.2	20.1	19.9
2.8	β Lupi		136	05.3	05.5	05.6	05.7	05.7	05.5	-42	57.6	57.6	57.6	57.5	57.4	57.4
2.7	β Libræ		131	20.4	20.5	20.6	20.7	20.7	20.5	- 9	13.3	13.2	13.2	13.2	13.2	13.3
3.1	γ Trianguli Aust.		131	18.1	18.5	18.8	19.0	19.0	18.7	-68	31.4	31.4	31.3	31.2	31.1	31.0

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Mag.	Name and No.	S.A.							Declination						
			Jan.	Feb.	Mar.	Apr.	May	June		Jan.	Feb.	Mar.	Apr.	May	June
3.1	γ Ursæ Minoris §	129	48.8	48.2	47.7	47.3	47.2	47.4	+71	59.3	59.2	59.2	59.4	59.5	59.7
3.0	γ Lupi §	126	57.8	57.5	57.2	57.0	56.9	56.8	-41	01.0	01.0	01.1	01.2	01.2	01.3
2.3	Alphecca	126	48.2	48.0	47.8	47.6	47.5	47.5	+26	51.6	51.6	51.5	51.6	51.7	51.8
2.8	α Serpentis	124	29.1	28.9	28.7	28.5	28.4	28.4	+6	33.8	33.7	33.7	33.7	33.8	33.8
3.0	β Trianguli Aust.	122	12.5	12.1	11.6	11.2	11.0	10.9	-63	17.5	17.5	17.6	17.7	17.8	17.9
2.5	δ Scorpïi	120	34.8	34.6	34.4	34.2	34.0	33.9	-22	29.7	29.8	29.8	29.9	29.9	29.9
2.8	β Scorpïi	119	17.6	17.4	17.1	16.9	16.8	16.7	-19	41.1	41.1	41.2	41.2	41.2	41.2
3.0	δ Ophiuchi	116	60.1	59.9	59.7	59.5	59.4	59.3	-3	34.9	35.0	35.0	35.0	35.0	34.9
2.9	η Draconis	114	09.7	09.4	09.0	08.7	08.5	08.5	+61	36.6	36.5	36.5	36.6	36.8	36.9
1.2	Antares	113	20.2	20.0	19.7	19.5	19.3	19.2	-26	20.0	20.1	20.1	20.1	20.2	20.2
2.8	β Herculis	112	55.7	55.5	55.3	55.1	55.0	54.9	+21	35.0	34.9	34.9	34.9	35.0	35.1
2.9	τ Scorpïi	111	43.7	43.5	43.2	43.0	42.8	42.7	-28	07.5	07.5	07.5	07.6	07.6	07.6
2.7	ζ Ophiuchi	111	19.7	19.5	19.3	19.1	18.9	18.8	-10	28.7	28.8	28.8	28.8	28.8	28.8
3.0	ζ Herculis	110	06.2	06.0	05.8	05.6	05.4	05.4	+31	40.8	40.7	40.6	40.7	40.8	41.0
1.9	Atria	108	61.8	61.3	60.7	60.2	59.8	59.6	-68	56.7	56.7	56.7	56.8	56.9	57.0
2.4	ϵ Scorpïi	108	11.2	11.0	10.7	10.5	10.3	10.2	-34	12.8	12.8	12.8	12.9	12.9	12.9
3.1	ζ Aræ	106	16.6	16.3	15.9	15.5	15.3	15.1	-55	55.2	55.2	55.2	55.2	55.3	55.4
2.6	Sabik	103	03.0	02.8	02.6	02.3	02.2	02.1	-15	40.3	40.3	40.4	40.4	40.3	40.3
Var.*	α Herculis	101	51.1	50.9	50.7	50.5	50.3	50.2	+14	26.3	26.2	26.2	26.2	26.3	26.4
2.8	β Aræ	99	36.7	36.4	36.0	35.6	35.3	35.1	-55	29.3	29.3	29.2	29.3	29.4	29.4
2.8	ν Scorpïi	98	04.4	04.2	03.9	03.6	03.4	03.3	-37	15.7	15.7	15.7	15.7	15.7	15.8
3.0	α Aræ	97	54.6	54.3	54.0	53.6	53.3	53.2	-49	50.5	50.5	50.5	50.5	50.5	50.6
3.0	β Draconis	97	39.1	38.9	38.6	38.3	38.1	38.0	+52	19.8	19.7	19.7	19.7	19.9	20.0
1.7	Shaula	97	21.7	21.5	21.2	20.9	20.7	20.5	-37	04.3	04.3	04.3	04.3	04.4	04.4
2.1	Rasalhague	96	47.4	47.2	47.0	46.7	46.6	46.4	+12	35.4	35.3	35.2	35.3	35.4	35.5
2.0	θ Scorpïi	96	28.7	28.5	28.2	27.9	27.6	27.5	-42	58.2	58.2	58.2	58.2	58.3	58.3
2.5	κ Scorpïi	95	09.4	09.1	08.9	08.6	08.3	08.2	-39	00.5	00.5	00.5	00.5	00.5	00.5
2.9	β Ophiuchi	94	41.3	41.1	40.9	40.7	40.5	40.4	+4	35.0	34.9	34.9	34.9	35.0	35.1
2.4	Eltanin	91	07.0	06.7	06.5	06.2	05.9	05.8	+51	29.4	29.3	29.3	29.3	29.4	29.6
3.1	γ Sagittarii	89	16.2	16.0	15.8	15.5	15.3	15.1	-30	25.6	25.6	25.6	25.6	25.6	25.6
2.8	δ Sagittarii	85	28.3	28.1	27.8	27.6	27.3	27.2	-29	50.9	50.9	50.9	50.9	50.9	50.9
2.0	Kaus Australis	84	42.2	42.0	41.7	41.5	41.2	41.0	-34	24.5	24.4	24.4	24.4	24.4	24.4
2.9	λ Sagittarii	83	42.1	41.9	41.7	41.4	41.2	41.0	-25	26.9	26.9	26.9	26.9	26.9	26.8
0.1	Vega	81	09.0	08.8	08.6	08.4	08.1	08.0	+38	44.4	44.2	44.2	44.2	44.3	44.4
2.1	Nunki	76	52.9	52.7	52.5	52.2	52.0	51.8	-26	21.3	21.3	21.2	21.2	21.2	21.2
2.7	ζ Sagittarii	75	03.8	03.6	03.4	03.1	02.8	02.6	-29	56.8	56.8	56.7	56.7	56.7	56.7
3.0	ζ Aquilæ	74	10.0	09.8	09.6	09.4	09.2	09.0	+13	47.7	47.6	47.5	47.6	47.6	47.8
3.0	π Sagittarii	73	13.7	13.5	13.3	13.1	12.8	12.6	-21	05.8	05.8	05.8	05.8	05.7	05.7
3.2	β Cygni	67	46.6	46.4	46.3	46.0	45.8	45.6	+27	51.8	51.7	51.6	51.7	51.7	51.9
3.0	δ Cygni	64	06.8	06.7	06.5	06.2	05.9	05.7	+45	01.2	01.1	01.0	01.0	01.1	01.2
2.8	γ Aquilæ	63	58.3	58.2	58.0	57.8	57.5	57.4	+10	30.1	30.1	30.0	30.0	30.1	30.2
0.9	Altair	62	51.2	51.1	51.0	50.7	50.5	50.3	+8	44.9	44.8	44.8	44.8	44.9	45.0
2.3	γ Cygni	54	51.0	51.0	50.8	50.6	50.3	50.1	+40	06.8	06.6	06.5	06.5	06.6	06.7
2.1	Peacock	54	28.6	28.5	28.2	27.9	27.5	27.1	-56	52.9	52.8	52.6	52.6	52.5	52.5
3.2	α Indi	51	23.9	23.8	23.6	23.3	23.0	22.7	-47	27.0	26.9	26.8	26.7	26.7	26.7
1.3	Deneb	53	50	01.8	01.8	01.6	01.4	01.1	+45	07.2	07.1	07.0	06.9	07.0	07.1
2.6	ϵ Cygni	48	54.3	54.3	54.1	53.9	53.6	53.4	+33	48.1	48.0	47.9	47.9	48.0	48.1
2.6	α Cephei	40	37.9	38.0	37.8	37.5	37.1	36.7	+62	23.9	23.7	23.6	23.5	23.5	23.6
3.1	β Aquarii	37	42.1	42.1	42.0	41.8	41.6	41.3	-5	46.2	46.2	46.2	46.1	46.1	46.0
2.5	Enif	34	30.4	30.3	30.3	30.1	29.9	29.6	+9	40.1	40.1	40.1	40.1	40.1	40.2
3.0	δ Capricorni	33	51.6	51.5	51.4	51.3	51.0	50.8	-16	19.9	19.9	19.9	19.8	19.7	19.6
2.2	Al Na'ir	28	38.9	38.9	38.8	38.6	38.3	38.0	-47	10.9	10.8	10.6	10.5	10.4	10.3
2.9	α Tucanæ	26	08.5	08.6	08.4	08.2	07.8	07.4	-60	29.2	29.1	28.9	28.7	28.6	28.6
2.2	β Gruis	19	60.1	60.2	60.1	59.9	59.7	59.4	-47	07.3	07.2	07.1	07.0	06.8	06.7
1.3	Fomalhaut	16	12.4	12.4	12.4	12.2	12.0	11.8	-29	51.7	51.7	51.6	51.5	51.4	51.3
2.6	β Pegasi	14	36.1	36.2	36.1	36.0	35.8	35.5	+27	50.5	50.4	50.3	50.3	50.3	50.4
2.6	Markab	14	22.2	22.2	22.2	22.0	21.8	21.6	+14	57.9	57.8	57.8	57.8	57.8	57.9
3.4	γ Cephei §	5	38.3	38.8	39.0	38.7	38.0	37.2	+77	23.3	23.2	23.0	22.9	22.8	22.8

*3.0-3.7.

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Mag.	Name and No.	SHA							Declination						
			July	Aug.	Sept.	Oct.	Nov.	Dec.		July	Aug.	Sept.	Oct.	Nov.	Dec.
3.1	γ Ursæ Minoris §	129	47.8	48.3	48.9	49.3	49.4	49.3	+71	59.8	59.8	59.7	59.6	59.4	59.2
3.0	γ Lupi §	126	56.9	57.0	57.1	57.3	57.2	57.1	-41	01.3	01.3	01.3	01.2	01.2	01.1
2.3	Alphecca	126	47.5	47.7	47.8	47.9	47.9	47.8	+26	51.9	52.0	51.9	51.9	51.8	51.6
2.8	α Serpentis	124	28.4	28.5	28.6	28.7	28.7	28.6	+6	33.9	33.9	33.9	33.9	33.8	33.7
3.0	β Trianguli Aust.	122	11.0	11.2	11.5	11.7	11.8	11.6	-63	18.0	18.0	18.0	17.9	17.8	17.7
2.5	δ Scorp̄ii	120	34.0	34.1	34.2	34.3	34.3	34.2	-22	29.9	29.9	29.9	29.8	29.8	29.8
2.8	β Scorp̄ii	119	16.8	16.8	17.0	17.1	17.1	17.0	-19	41.2	41.2	41.2	41.1	41.1	41.1
3.0	δ Ophiuchi	116	59.3	59.4	59.5	59.6	59.6	59.5	-3	34.9	34.8	34.8	34.8	34.9	34.9
2.9	η Draconis	114	08.7	09.0	09.3	09.7	09.8	09.8	+61	37.1	37.1	37.1	37.1	36.9	36.7
1.2	Antares	113	19.2	19.3	19.5	19.6	19.6	19.5	-26	20.2	20.2	20.2	20.1	20.1	20.1
2.8	β Herculis	112	54.9	55.0	55.2	55.3	55.3	55.3	+21	35.2	35.3	35.3	35.3	35.2	35.0
2.9	τ Scorp̄ii	111	42.7	42.8	43.0	43.1	43.1	43.0	-28	07.6	07.6	07.6	07.6	07.5	07.5
2.7	ζ Ophiuchi	111	18.8	18.9	19.0	19.2	19.2	19.1	-10	28.7	28.7	28.7	28.7	28.7	28.7
3.0	ζ Herculis	110	05.4	05.5	05.7	05.8	05.9	05.9	+31	41.1	41.2	41.2	41.1	41.0	40.9
1.9	Atria	108	59.6	59.9	60.3	60.6	60.8	60.6	-68	57.1	57.2	57.2	57.2	57.0	56.9
2.4	ε Scorp̄ii	108	10.1	10.2	10.4	10.5	10.6	10.5	-34	13.0	13.0	13.0	12.9	12.9	12.8
3.1	ζ Aræ	106	15.1	15.2	15.5	15.7	15.8	15.7	-55	55.5	55.5	55.5	55.5	55.4	55.3
2.6	Sabik	103	02.0	02.1	02.2	02.3	02.4	02.3	-15	40.3	40.3	40.3	40.3	40.3	40.3
Var.*	α Herculis	101	50.2	50.3	50.4	50.5	50.6	50.6	+14	26.5	26.5	26.6	26.5	26.5	26.4
2.8	β Aræ	99	35.1	35.2	35.4	35.6	35.8	35.7	-55	29.5	29.6	29.6	29.6	29.5	29.4
2.8	ν Scorp̄ii	98	03.2	03.3	03.4	03.6	03.6	03.6	-37	15.8	15.8	15.8	15.8	15.8	15.7
3.0	α Aræ	97	53.1	53.2	53.4	53.6	53.7	53.6	-49	50.7	50.7	50.8	50.7	50.7	50.6
3.0	β Draconis	97	38.0	38.2	38.4	38.7	38.9	38.9	+52	20.2	20.3	20.3	20.3	20.2	20.0
1.7	Shaula	97	20.5	20.5	20.7	20.8	20.9	20.9	-37	04.5	04.5	04.5	04.5	04.4	04.4
2.1	Rasalhague	96	46.4	46.5	46.6	46.7	46.8	46.8	+12	35.5	35.6	35.6	35.6	35.6	35.5
2.0	θ Scorp̄ii	96	27.4	27.5	27.6	27.8	27.9	27.8	-42	58.4	58.4	58.4	58.4	58.3	58.3
2.5	κ Scorp̄ii	95	08.1	08.2	08.3	08.5	08.6	08.5	-39	00.6	00.6	00.6	00.6	00.6	00.5
2.9	β Ophiuchi	94	40.3	40.4	40.5	40.6	40.7	40.7	+4	35.1	35.2	35.2	35.2	35.2	35.1
2.4	Eltanin	91	05.8	06.0	06.2	06.4	06.6	06.7	+51	29.8	29.9	29.9	29.9	29.8	29.7
3.1	γ Sagittarii	89	15.0	15.1	15.2	15.3	15.4	15.4	-30	25.6	25.6	25.6	25.6	25.6	25.6
2.8	δ Sagittarii	85	27.1	27.1	27.2	27.4	27.5	27.5	-29	50.9	50.9	50.9	50.9	50.9	50.9
2.0	Kaus Australis	84	40.9	41.0	41.1	41.2	41.4	41.4	-34	24.4	24.5	24.5	24.5	24.5	24.4
2.9	λ Sagittarii	83	40.9	40.9	41.1	41.2	41.3	41.3	-25	26.8	26.9	26.9	26.9	26.9	26.8
0.1	Vega	81	07.9	08.0	08.1	08.3	08.5	08.6	+38	44.6	44.7	44.8	44.8	44.7	44.6
2.1	Nunki	76	51.7	51.7	51.8	51.9	52.0	52.0	-26	21.2	21.2	21.2	21.2	21.2	21.2
2.7	ζ Sagittarii	75	02.5	02.5	02.6	02.8	02.9	02.9	-29	56.7	56.7	56.7	56.7	56.7	56.7
3.0	ζ Aquilæ	74	08.9	08.9	09.0	09.2	09.3	09.3	+13	47.9	48.0	48.0	48.0	48.0	47.9
3.0	π Sagittarii	73	12.5	12.5	12.6	12.7	12.9	12.9	-21	05.7	05.7	05.7	05.7	05.7	05.7
3.2	β Cygni	67	45.5	45.5	45.6	45.8	45.9	46.0	+27	52.0	52.1	52.2	52.3	52.2	52.1
3.0	δ Cygni	64	05.6	05.6	05.7	05.9	06.2	06.3	+45	01.4	01.5	01.6	01.7	01.7	01.6
2.8	γ Aquilæ	63	57.2	57.2	57.3	57.4	57.5	57.6	+10	30.3	30.4	30.5	30.5	30.5	30.4
0.9	Altair	62	50.2	50.2	50.3	50.4	50.5	50.5	+8	45.1	45.2	45.2	45.3	45.2	45.2
2.3	γ Cygni	54	49.9	49.9	50.0	50.1	50.3	50.5	+40	06.9	07.0	07.2	07.2	07.2	07.1
2.1	Peacock	54	26.9	26.8	26.9	27.1	27.3	27.5	-56	52.6	52.7	52.8	52.8	52.8	52.8
3.2	α Indi	51	22.4	22.4	22.4	22.6	22.8	22.9	-47	26.7	26.8	26.8	26.9	26.9	26.9
1.3	Deneb	50	00.6	00.6	00.7	00.9	01.1	01.2	+45	07.3	07.5	07.6	07.7	07.7	07.6
2.6	ε Cygni	48	53.2	53.2	53.2	53.4	53.5	53.7	+33	48.2	48.4	48.5	48.6	48.6	48.5
2.6	α Cephei	40	36.4	36.4	36.5	36.7	37.0	37.3	+62	23.8	24.0	24.2	24.3	24.3	24.3
3.1	β Aquarii	37	41.1	41.0	41.0	41.1	41.2	41.3	-5	45.9	45.8	45.8	45.8	45.8	45.9
2.5	Enif	34	29.4	29.3	29.3	29.4	29.5	29.6	+9	40.3	40.5	40.5	40.6	40.6	40.5
3.0	δ Capricorni	33	50.6	50.5	50.5	50.5	50.6	50.7	-16	19.6	19.6	19.6	19.6	19.6	19.6
2.2	Al Na'ir	28	37.7	37.5	37.5	37.6	37.8	37.9	-47	10.3	10.4	10.5	10.6	10.6	10.6
2.9	α Tucanæ	26	07.0	06.8	06.8	06.9	07.2	07.4	-60	28.6	28.7	28.8	28.9	29.0	29.0
2.2	β Gruis	19	59.1	58.9	58.8	58.9	59.0	59.2	-47	06.7	06.8	06.9	07.0	07.0	07.0
1.3	Fomalhaut	16	11.5	11.3	11.3	11.3	11.4	11.5	-29	51.2	51.2	51.2	51.3	51.4	51.4
2.6	β Pegasi	14	35.3	35.1	35.1	35.1	35.2	35.3	+27	50.5	50.7	50.8	50.9	50.9	50.9
2.6	Markab	14	21.4	21.2	21.1	21.2	21.2	21.3	+14	58.0	58.2	58.3	58.3	58.3	58.3
3.4	γ Cephei §	5	36.5	35.9	35.7	35.8	36.2	36.8	+77	22.9	23.1	23.2	23.4	23.6	23.6

*3.0-3.7.

§Not suitable for use with H. O. 214.

°	h m	°	h m	°	h m	°	h m	°	h m	°	h m	°	h m	'	m s	"	s
0	0 00	60	4 00	120	8 00	180	12 00	240	16 00	300	20 00	0	0 00	0	0 00	0	0.00
1	0 04	61	4 04	121	8 04	181	12 04	241	16 04	301	20 04	1	0 04	1	0 04	1	0.07
2	0 08	62	4 08	122	8 08	182	12 08	242	16 08	302	20 08	2	0 08	2	0 08	2	0.13
3	0 12	63	4 12	123	8 12	183	12 12	243	16 12	303	20 12	3	0 12	3	0 12	3	0.20
4	0 16	64	4 16	124	8 16	184	12 16	244	16 16	304	20 16	4	0 16	4	0 16	4	0.27
5	0 20	65	4 20	125	8 20	185	12 20	245	16 20	305	20 20	5	0 20	5	0 20	5	0.33
6	0 24	66	4 24	126	8 24	186	12 24	246	16 24	306	20 24	6	0 24	6	0 24	6	0.40
7	0 28	67	4 28	127	8 28	187	12 28	247	16 28	307	20 28	7	0 28	7	0 28	7	0.47
8	0 32	68	4 32	128	8 32	188	12 32	248	16 32	308	20 32	8	0 32	8	0 32	8	0.53
9	0 36	69	4 36	129	8 36	189	12 36	249	16 36	309	20 36	9	0 36	9	0 36	9	0.60
10	0 40	70	4 40	130	8 40	190	12 40	250	16 40	310	20 40	10	0 40	10	0 40	10	0.67
11	0 44	71	4 44	131	8 44	191	12 44	251	16 44	311	20 44	11	0 44	11	0 44	11	0.73
12	0 48	72	4 48	132	8 48	192	12 48	252	16 48	312	20 48	12	0 48	12	0 48	12	0.80
13	0 52	73	4 52	133	8 52	193	12 52	253	16 52	313	20 52	13	0 52	13	0 52	13	0.87
14	0 56	74	4 56	134	8 56	194	12 56	254	16 56	314	20 56	14	0 56	14	0 56	14	0.93
15	1 00	75	5 00	135	9 00	195	13 00	255	17 00	315	21 00	15	1 00	15	1 00	15	1.00
16	1 04	76	5 04	136	9 04	196	13 04	256	17 04	316	21 04	16	1 04	16	1 04	16	1.07
17	1 08	77	5 08	137	9 08	197	13 08	257	17 08	317	21 08	17	1 08	17	1 08	17	1.13
18	1 12	78	5 12	138	9 12	198	13 12	258	17 12	318	21 12	18	1 12	18	1 12	18	1.20
19	1 16	79	5 16	139	9 16	199	13 16	259	17 16	319	21 16	19	1 16	19	1 16	19	1.27
20	1 20	80	5 20	140	9 20	200	13 20	260	17 20	320	21 20	20	1 20	20	1 20	20	1.33
21	1 24	81	5 24	141	9 24	201	13 24	261	17 24	321	21 24	21	1 24	21	1 24	21	1.40
22	1 28	82	5 28	142	9 28	202	13 28	262	17 28	322	21 28	22	1 28	22	1 28	22	1.47
23	1 32	83	5 32	143	9 32	203	13 32	263	17 32	323	21 32	23	1 32	23	1 32	23	1.53
24	1 36	84	5 36	144	9 36	204	13 36	264	17 36	324	21 36	24	1 36	24	1 36	24	1.60
25	1 40	85	5 40	145	9 40	205	13 40	265	17 40	325	21 40	25	1 40	25	1 40	25	1.67
26	1 44	86	5 44	146	9 44	206	13 44	266	17 44	326	21 44	26	1 44	26	1 44	26	1.73
27	1 48	87	5 48	147	9 48	207	13 48	267	17 48	327	21 48	27	1 48	27	1 48	27	1.80
28	1 52	88	5 52	148	9 52	208	13 52	268	17 52	328	21 52	28	1 52	28	1 52	28	1.87
29	1 56	89	5 56	149	9 56	209	13 56	269	17 56	329	21 56	29	1 56	29	1 56	29	1.93
30	2 00	90	6 00	150	10 00	210	14 00	270	18 00	330	22 00	30	2 00	30	2 00	30	2.00
31	2 04	91	6 04	151	10 04	211	14 04	271	18 04	331	22 04	31	2 04	31	2 04	31	2.07
32	2 08	92	6 08	152	10 08	212	14 08	272	18 08	332	22 08	32	2 08	32	2 08	32	2.13
33	2 12	93	6 12	153	10 12	213	14 12	273	18 12	333	22 12	33	2 12	33	2 12	33	2.20
34	2 16	94	6 16	154	10 16	214	14 16	274	18 16	334	22 16	34	2 16	34	2 16	34	2.27
35	2 20	95	6 20	155	10 20	215	14 20	275	18 20	335	22 20	35	2 20	35	2 20	35	2.33
36	2 24	96	6 24	156	10 24	216	14 24	276	18 24	336	22 24	36	2 24	36	2 24	36	2.40
37	2 28	97	6 28	157	10 28	217	14 28	277	18 28	337	22 28	37	2 28	37	2 28	37	2.47
38	2 32	98	6 32	158	10 32	218	14 32	278	18 32	338	22 32	38	2 32	38	2 32	38	2.53
39	2 36	99	6 36	159	10 36	219	14 36	279	18 36	339	22 36	39	2 36	39	2 36	39	2.60
40	2 40	100	6 40	160	10 40	220	14 40	280	18 40	340	22 40	40	2 40	40	2 40	40	2.67
41	2 44	101	6 44	161	10 44	221	14 44	281	18 44	341	22 44	41	2 44	41	2 44	41	2.73
42	2 48	102	6 48	162	10 48	222	14 48	282	18 48	342	22 48	42	2 48	42	2 48	42	2.80
43	2 52	103	6 52	163	10 52	223	14 52	283	18 52	343	22 52	43	2 52	43	2 52	43	2.87
44	2 56	104	6 56	164	10 56	224	14 56	284	18 56	344	22 56	44	2 56	44	2 56	44	2.93
45	3 00	105	7 00	165	11 00	225	15 00	285	19 00	345	23 00	45	3 00	45	3 00	45	3.00
46	3 04	106	7 04	166	11 04	226	15 04	286	19 04	346	23 04	46	3 04	46	3 04	46	3.07
47	3 08	107	7 08	167	11 08	227	15 08	287	19 08	347	23 08	47	3 08	47	3 08	47	3.13
48	3 12	108	7 12	168	11 12	228	15 12	288	19 12	348	23 12	48	3 12	48	3 12	48	3.20
49	3 16	109	7 16	169	11 16	229	15 16	289	19 16	349	23 16	49	3 16	49	3 16	49	3.27
50	3 20	110	7 20	170	11 20	230	15 20	290	19 20	350	23 20	50	3 20	50	3 20	50	3.33
51	3 24	111	7 24	171	11 24	231	15 24	291	19 24	351	23 24	51	3 24	51	3 24	51	3.40
52	3 28	112	7 28	172	11 28	232	15 28	292	19 28	352	23 28	52	3 28	52	3 28	52	3.47
53	3 32	113	7 32	173	11 32	233	15 32	293	19 32	353	23 32	53	3 32	53	3 32	53	3.53
54	3 36	114	7 36	174	11 36	234	15 36	294	19 36	354	23 36	54	3 36	54	3 36	54	3.60
55	3 40	115	7 40	175	11 40	235	15 40	295	19 40	355	23 40	55	3 40	55	3 40	55	3.67
56	3 44	116	7 44	176	11 44	236	15 44	296	19 44	356	23 44	56	3 44	56	3 44	56	3.73
57	3 48	117	7 48	177	11 48	237	15 48	297	19 48	357	23 48	57	3 48	57	3 48	57	3.80
58	3 52	118	7 52	178	11 52	238	15 52	298	19 52	358	23 52	58	3 52	58	3 52	58	3.87
59	3 56	119	7 56	179	11 56	239	15 56	299	19 56	359	23 56	59	3 56	59	3 56	59	3.93
60	4 00	120	8 00	180	12 00	240	16 00	300	20 00	360	24 00	60	4 00	60	4 00	60	4.00

[When the sign is plus, Polaris is east of north; when the sign is minus, it is west of north]

Lat. LHA T	+10°	+15°	+20°	+25°	+30°	+35°	+40°	+45°	+50°	+55°	+60°	+65°	+70°
0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	+0.5	+0.5	+0.5	+0.5	+0.5	+0.5	+0.6	+0.6	+0.7	+0.8	+0.9	+1.1	+1.4
20	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.9
30	+0.1	+0.1	+0.1	+0.2	+0.2	+0.2	+0.2	+0.2	+0.2	+0.2	+0.3	+0.3	+0.4
40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1
50	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3	-0.3	-0.3	-0.3	-0.4	-0.5	-0.6
60	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.9	1.1
70	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.9	1.0	1.2	1.5
80	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.9	1.0	1.1	1.3	1.5	1.9
90	-0.8	-0.8	-0.8	-0.8	-0.9	-0.9	-1.0	-1.1	-1.2	-1.3	-1.5	-1.8	-2.2
100	0.8	0.9	0.9	0.9	1.0	1.0	1.1	1.2	1.3	1.5	1.7	2.0	2.5
110	0.9	0.9	1.0	1.0	1.0	1.1	1.2	1.3	1.4	1.6	1.8	2.1	2.6
120	1.0	1.0	1.0	1.0	1.1	1.1	1.2	1.3	1.4	1.6	1.9	2.2	2.7
130	-1.0	-1.0	-1.0	-1.0	-1.1	-1.1	-1.2	-1.3	-1.5	-1.6	-1.9	-2.2	-2.7
140	0.9	1.0	1.0	1.0	1.1	1.1	1.2	1.3	1.4	1.6	1.8	2.2	2.7
150	0.9	0.9	0.9	1.0	1.0	1.1	1.1	1.2	1.4	1.5	1.7	2.0	2.5
160	0.8	0.8	0.8	0.9	0.9	1.0	1.0	1.1	1.2	1.4	1.6	1.9	2.3
170	-0.7	-0.7	-0.7	-0.8	-0.8	-0.8	-0.9	-1.0	-1.1	-1.2	-1.4	-1.6	-2.0
180	0.6	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.9	1.0	1.1	1.3	1.6
190	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.8	0.9	1.0	1.2
200	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.6	0.7	0.8
210	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3	-0.3	-0.4
220	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	+0.1	+0.1	+0.1	+0.1
230	+0.2	+0.2	+0.2	+0.2	+0.2	+0.2	+0.2	+0.3	+0.3	0.3	0.4	0.4	0.5
240	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.7	0.8	1.0
250	+0.5	+0.5	+0.5	+0.5	+0.6	+0.6	+0.6	+0.7	+0.8	+0.8	+1.0	+1.1	+1.4
260	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.9	1.0	1.1	1.2	1.4	1.8
270	0.8	0.8	0.8	0.8	0.8	0.9	1.0	1.0	1.1	1.3	1.5	1.7	2.1
280	0.8	0.9	0.9	0.9	1.0	1.0	1.1	1.2	1.3	1.4	1.6	1.9	2.4
290	+0.9	+0.9	+1.0	+1.0	+1.0	+1.1	+1.2	+1.3	+1.4	+1.6	+1.8	+2.1	+2.6
300	1.0	1.0	1.0	1.0	1.1	1.1	1.2	1.3	1.4	1.6	1.9	2.2	2.7
310	1.0	1.0	1.0	1.0	1.1	1.1	1.2	1.3	1.5	1.6	1.9	2.2	2.8
320	0.9	1.0	1.0	1.0	1.1	1.1	1.2	1.3	1.4	1.6	1.9	2.2	2.7
330	+0.9	+0.9	+0.9	+1.0	+1.0	+1.1	+1.1	+1.2	+1.4	+1.6	+1.8	+2.1	+2.6
340	0.8	0.8	0.9	0.9	0.9	1.0	1.1	1.1	1.3	1.4	1.6	1.9	2.4
350	0.7	0.7	0.8	0.8	0.8	0.9	0.9	1.0	1.1	1.2	1.4	1.7	2.1
360	0.6	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.9	1.0	1.2	1.4	1.8
370	+0.4	+0.5	+0.5	+0.5	+0.5	+0.5	+0.6	+0.6	+0.7	+0.8	+0.9	+1.1	+1.4

FIRST CORRECTION TO CORRECTED ALTITUDE

L H A T	Corr.	L H A T	Corr.	L H A T	Corr.	L H A T	Corr.	L H A T	Corr.	L H A T	Corr.
0	-49.7	60	-47.9	120	+ 2.2	180	+49.9	240	+48.2	300	- 1.3
1	50.2	61	47.4	121	3.2	181	50.4	241	47.6	301	2.3
2	50.6	62	46.8	122	4.2	182	50.8	242	47.1	302	3.3
3	51.1	63	46.3	123	5.2	183	51.2	243	46.6	303	4.3
4	51.5	64	45.7	124	6.2	184	51.6	244	46.0	304	5.2
5	-51.9	65	-45.1	125	+ 7.2	185	+52.0	245	+45.4	305	- 6.2
6	52.3	66	44.5	126	8.1	186	52.4	246	44.8	306	7.2
7	52.6	67	43.9	127	9.1	187	52.8	247	44.2	307	8.2
8	53.0	68	43.2	128	10.1	188	53.1	248	43.6	308	9.2
9	53.3	69	42.6	129	11.0	189	53.4	249	43.0	309	10.2
10	-53.6	70	-41.9	130	+12.0	190	+53.8	250	+42.4	310	-11.1
11	54.0	71	41.3	131	13.0	191	54.0	251	41.7	311	12.1
12	54.2	72	40.6	132	13.9	192	54.3	252	41.0	312	13.0
13	54.5	73	39.9	133	14.9	193	54.6	253	40.3	313	14.0
14	54.8	74	39.2	134	15.8	194	54.8	254	39.6	314	15.0
15	-55.0	75	-38.4	135	+16.8	195	+55.1	255	+38.9	315	-15.9
16	55.2	76	37.7	136	17.7	196	55.3	256	38.2	316	16.9
17	55.4	77	37.0	137	18.6	197	55.5	257	37.5	317	17.8
18	55.6	78	36.2	138	19.6	198	55.6	258	36.8	318	18.8
19	55.8	79	35.4	139	20.5	199	55.8	259	36.0	319	19.7
20	-55.9	80	-34.7	140	+21.4	200	+56.0	260	+35.2	320	-20.6
21	56.1	81	33.9	141	22.3	201	56.1	261	34.5	321	21.5
22	56.2	82	33.1	142	23.2	202	56.2	262	33.7	322	22.4
23	56.3	83	32.3	143	24.1	203	56.3	263	32.9	323	23.3
24	56.4	84	31.4	144	25.0	204	56.4	264	32.1	324	24.2
25	-56.4	85	-30.6	145	+25.9	205	+56.4	265	+31.3	325	-25.1
26	56.5	86	29.8	146	26.7	206	56.5	266	30.5	326	26.0
27	56.5	87	29.0	147	27.6	207	56.5	267	29.6	327	26.9
28	56.5	88	28.1	148	28.4	208	56.5	268	28.8	328	27.8
29	56.5	89	27.2	149	29.3	209	56.5	269	27.9	329	28.6
30	-56.5	90	-26.4	150	+30.1	210	+56.5	270	+27.1	330	-29.4
31	56.5	91	25.5	151	31.0	211	56.5	271	26.2	331	30.3
32	56.4	92	24.6	152	31.8	212	56.4	272	25.3	332	31.1
33	56.3	93	23.7	153	32.6	213	56.3	273	24.4	333	32.0
34	56.2	94	22.8	154	33.4	214	56.2	274	23.6	334	32.8
35	-56.1	95	-21.9	155	+34.2	215	+56.2	275	+22.7	335	-33.6
36	56.0	96	21.0	156	34.9	216	56.0	276	21.8	336	34.4
37	55.9	97	20.0	157	35.7	217	55.9	277	20.8	337	35.2
38	55.7	98	19.1	158	36.4	218	55.7	278	19.9	338	35.9
39	55.5	99	18.2	159	37.2	219	55.6	279	19.0	339	36.7
40	-55.3	100	-17.2	160	+37.9	220	+55.4	280	+18.1	340	-37.4
41	55.1	101	16.3	161	38.6	221	55.2	281	17.2	341	38.2
42	54.9	102	15.4	162	39.4	222	54.9	282	16.2	342	38.9
43	54.6	103	14.4	163	40.1	223	54.7	283	15.2	343	39.6
44	54.4	104	13.4	164	40.8	224	54.4	284	14.3	344	40.3
45	-54.1	105	-12.5	165	+41.4	225	+54.2	285	+13.4	345	-41.0
46	53.8	106	11.5	166	42.1	226	53.9	286	12.4	346	41.7
47	53.5	107	10.5	167	42.7	227	53.6	287	11.4	347	42.3
48	53.1	108	9.6	168	43.4	228	53.2	288	10.4	348	43.0
49	52.8	109	8.6	169	44.0	229	52.9	289	9.5	349	43.6
50	-52.4	110	- 7.6	170	+44.6	230	+52.6	290	+ 8.5	350	-44.2
51	52.0	111	6.6	171	45.2	231	52.2	291	7.5	351	44.8
52	51.6	112	5.6	172	45.8	232	51.8	292	6.6	352	45.4
53	51.2	113	4.7	173	46.4	233	51.4	293	5.6	353	46.0
54	50.8	114	3.7	174	46.9	234	51.0	294	4.6	354	46.6
55	-50.4	115	- 2.7	175	+47.4	235	+50.6	295	+ 3.6	355	-47.2
56	49.9	116	1.7	176	48.0	236	50.1	296	2.6	356	47.7
57	49.4	117	- 0.7	177	48.5	237	49.6	297	1.6	357	48.2
58	49.0	118	+ 0.3	178	49.0	238	49.2	298	+ 0.7	358	48.8
59	48.4	119	1.2	179	49.4	239	48.7	299	- 0.3	359	49.2
60	-47.9	120	+ 2.2	180	+49.9	240	+48.2	300	- 1.3	360	-49.7

SECOND CORRECTION TO CORRECTED ALTITUDE

Date LHA T	Jan. 1	Feb. 1	Mar. 1	Apr. 1	May 1	June 1	July 1	Aug. 1	Sept. 1	Oct. 1	Nov. 1	Dec. 1	Dec. 32
0	+0.1	+0.1	0.0	-0.2	-0.3	-0.4	-0.4	-0.3	-0.1	+0.1	+0.3	+0.4	+0.5
20	+0.1	+0.1	+0.1	-0.1	-0.2	-0.3	-0.4	-0.3	-0.2	0.0	+0.2	+0.3	+0.4
40	+0.1	+0.2	+0.2	0.0	-0.1	-0.3	-0.3	-0.4	-0.3	-0.2	0.0	+0.2	+0.3
60	+0.1	+0.2	+0.2	+0.2	0.0	-0.1	-0.3	-0.3	-0.3	-0.3	-0.1	+0.1	+0.2
80	+0.1	+0.2	+0.3	+0.3	+0.1	0.0	-0.1	-0.3	-0.3	-0.3	-0.2	-0.1	+0.1
100	0.0	+0.2	+0.3	+0.3	+0.2	+0.2	0.0	-0.2	-0.3	-0.3	-0.3	-0.2	-0.1
120	0.0	+0.1	+0.3	+0.4	+0.3	+0.3	+0.1	0.0	-0.2	-0.3	-0.4	-0.4	-0.2
140	-0.1	+0.1	+0.2	+0.4	+0.4	+0.4	+0.2	+0.1	-0.1	-0.3	-0.4	-0.4	-0.4
160	-0.1	0.0	+0.1	+0.3	+0.4	+0.4	+0.3	+0.2	0.0	-0.2	-0.3	-0.4	-0.4
180	-0.1	-0.1	0.0	+0.2	+0.3	+0.4	+0.4	+0.3	+0.1	-0.1	-0.3	-0.4	-0.5
200	-0.1	-0.1	-0.1	+0.1	+0.2	+0.3	+0.4	+0.3	+0.2	0.0	-0.2	-0.3	-0.4
220	-0.1	-0.2	-0.2	0.0	+0.1	+0.3	+0.3	+0.4	+0.3	+0.2	0.0	-0.2	-0.3
240	-0.1	-0.2	-0.2	-0.2	0.0	+0.1	+0.3	+0.3	+0.3	+0.3	+0.1	-0.1	-0.2
260	-0.1	-0.2	-0.3	-0.3	-0.1	0.0	+0.1	+0.3	+0.3	+0.3	+0.2	+0.1	-0.1
280	0.0	-0.2	-0.3	-0.3	-0.2	-0.2	0.0	+0.2	+0.3	+0.3	+0.3	+0.2	+0.1
300	0.0	-0.1	-0.3	-0.4	-0.3	-0.3	-0.1	0.0	+0.2	+0.3	+0.4	+0.4	+0.2
320	+0.1	-0.1	-0.2	-0.4	-0.4	-0.4	-0.2	-0.1	+0.1	+0.3	+0.4	+0.4	+0.4
340	+0.1	0.0	-0.1	-0.3	-0.4	-0.4	-0.3	-0.2	0.0	+0.2	+0.3	+0.4	+0.4
360	+0.1	+0.1	0.0	-0.2	-0.3	-0.4	-0.4	-0.3	-0.1	+0.1	+0.3	+0.4	+0.5

LATITUDE BY POLARIS, 1955

THIRD CORRECTION TO CORRECTED ALTITUDE

Altitude LHA T	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°
0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	+0.1	+0.1	+0.2
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
60	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	+0.1	+0.1	+0.2	+0.2
80	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.2	+0.4	+0.5
100	-0.3	-0.3	-0.3	-0.2	-0.2	-0.1	-0.1	0.0	+0.1	+0.2	+0.3	+0.5	+0.7
120	-0.4	-0.3	-0.3	-0.2	-0.2	-0.1	-0.1	0.0	+0.1	+0.2	+0.3	+0.6	+0.8
140	-0.3	-0.3	-0.2	-0.2	-0.2	-0.1	-0.1	0.0	+0.1	+0.2	+0.3	+0.5	+0.7
160	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.2	+0.3	+0.4
180	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	+0.1	+0.1	+0.2
200	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
220	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
240	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	+0.1	+0.1	+0.2	+0.2
260	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.2	+0.4	+0.5
280	-0.3	-0.3	-0.3	-0.2	-0.2	-0.1	-0.1	0.0	+0.1	+0.2	+0.3	+0.5	+0.7
300	-0.4	-0.3	-0.3	-0.2	-0.2	-0.1	-0.1	0.0	+0.1	+0.2	+0.3	+0.6	+0.8
320	-0.3	-0.3	-0.2	-0.2	-0.2	-0.1	-0.1	0.0	+0.1	+0.2	+0.3	+0.5	+0.7
340	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	0.0	0.0	+0.1	+0.1	+0.2	+0.3	+0.4
360	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	+0.1	+0.1	+0.2

Sec.	SUN PLANET	☿	MOON	code	corr'n	code	corr'n	code	corr'n	Sec.	SUN PLANET	☿	MOON	code	corr'n	code	corr'n	code	corr'n
0	0 00.0	0 00.0	0 00.0	0	0.0	60	0.1	120	0.1	0	0 15.0	0 15.0	0 14.3	0	0.0	60	0.2	120	0.3
1	0 00.3	0 00.3	0 00.2	1	0.0	61	0.1	121	0.1	1	0 15.3	0 15.3	0 14.6	1	0.0	61	0.2	121	0.3
2	0 00.5	0 00.5	0 00.5	2	0.0	62	0.1	122	0.1	2	0 15.5	0 15.5	0 14.8	2	0.0	62	0.2	122	0.3
3	0 00.8	0 00.8	0 00.7	3	0.0	63	0.1	123	0.1	3	0 15.8	0 15.8	0 15.0	3	0.0	63	0.2	123	0.3
4	0 01.0	0 01.0	0 01.0	4	0.0	64	0.1	124	0.1	4	0 16.0	0 16.0	0 15.3	4	0.0	64	0.2	124	0.3
5	0 01.3	0 01.3	0 01.2	5	0.0	65	0.1	125	0.1	5	0 16.3	0 16.3	0 15.5	5	0.0	65	0.2	125	0.3
6	0 01.5	0 01.5	0 01.4	6	0.0	66	0.1	126	0.1	6	0 16.5	0 16.5	0 15.7	6	0.0	66	0.2	126	0.3
7	0 01.8	0 01.8	0 01.7	7	0.0	67	0.1	127	0.1	7	0 16.8	0 16.8	0 16.0	7	0.0	67	0.2	127	0.3
8	0 02.0	0 02.0	0 01.9	8	0.0	68	0.1	128	0.1	8	0 17.0	0 17.0	0 16.2	8	0.0	68	0.2	128	0.3
9	0 02.3	0 02.3	0 02.1	9	0.0	69	0.1	129	0.1	9	0 17.3	0 17.3	0 16.5	9	0.0	69	0.2	129	0.3
10	0 02.5	0 02.5	0 02.4	10	0.0	70	0.1	130	0.1	10	0 17.5	0 17.5	0 16.7	10	0.0	70	0.2	130	0.3
11	0 02.8	0 02.8	0 02.6	11	0.0	71	0.1	131	0.1	11	0 17.8	0 17.8	0 16.9	11	0.0	71	0.2	131	0.3
12	0 03.0	0 03.0	0 02.9	12	0.0	72	0.1	132	0.1	12	0 18.0	0 18.0	0 17.2	12	0.0	72	0.2	132	0.3
13	0 03.3	0 03.3	0 03.1	13	0.0	73	0.1	133	0.1	13	0 18.3	0 18.3	0 17.4	13	0.0	73	0.2	133	0.3
14	0 03.5	0 03.5	0 03.3	14	0.0	74	0.1	134	0.1	14	0 18.5	0 18.6	0 17.7	14	0.0	74	0.2	134	0.3
15	0 03.8	0 03.8	0 03.6	15	0.0	75	0.1	135	0.1	15	0 18.8	0 18.8	0 17.9	15	0.0	75	0.2	135	0.3
16	0 04.0	0 04.0	0 03.8	16	0.0	76	0.1	136	0.1	16	0 19.0	0 19.1	0 18.1	16	0.0	76	0.2	136	0.3
17	0 04.3	0 04.3	0 04.1	17	0.0	77	0.1	137	0.1	17	0 19.3	0 19.3	0 18.4	17	0.0	77	0.2	137	0.3
18	0 04.5	0 04.5	0 04.3	18	0.0	78	0.1	138	0.1	18	0 19.5	0 19.6	0 18.6	18	0.0	78	0.2	138	0.3
19	0 04.8	0 04.8	0 04.5	19	0.0	79	0.1	139	0.1	19	0 19.8	0 19.8	0 18.9	19	0.0	79	0.2	139	0.3
20	0 05.0	0 05.0	0 04.8	20	0.0	80	0.1	140	0.1	20	0 20.0	0 20.1	0 19.1	20	0.1	80	0.2	140	0.4
21	0 05.3	0 05.3	0 05.0	21	0.0	81	0.1	141	0.1	21	0 20.3	0 20.3	0 19.3	21	0.1	81	0.2	141	0.4
22	0 05.5	0 05.5	0 05.2	22	0.0	82	0.1	142	0.1	22	0 20.5	0 20.6	0 19.6	22	0.1	82	0.2	142	0.4
23	0 05.8	0 05.8	0 05.5	23	0.0	83	0.1	143	0.1	23	0 20.8	0 20.8	0 19.8	23	0.1	83	0.2	143	0.4
24	0 06.0	0 06.0	0 05.7	24	0.0	84	0.1	144	0.1	24	0 21.0	0 21.1	0 20.0	24	0.1	84	0.2	144	0.4
25	0 06.3	0 06.3	0 06.0	25	0.0	85	0.1	145	0.1	25	0 21.3	0 21.3	0 20.3	25	0.1	85	0.2	145	0.4
26	0 06.5	0 06.5	0 06.2	26	0.0	86	0.1	146	0.1	26	0 21.5	0 21.6	0 20.5	26	0.1	86	0.2	146	0.4
27	0 06.8	0 06.8	0 06.4	27	0.0	87	0.1	147	0.1	27	0 21.8	0 21.8	0 20.8	27	0.1	87	0.2	147	0.4
28	0 07.0	0 07.0	0 06.7	28	0.0	88	0.1	148	0.1	28	0 22.0	0 22.1	0 21.0	28	0.1	88	0.2	148	0.4
29	0 07.3	0 07.3	0 06.9	29	0.0	89	0.1	149	0.1	29	0 22.3	0 22.3	0 21.2	29	0.1	89	0.2	149	0.4
30	0 07.5	0 07.5	0 07.2	30	0.0	90	0.1	150	0.1	30	0 22.5	0 22.6	0 21.5	30	0.1	90	0.2	150	0.4
31	0 07.8	0 07.8	0 07.4	31	0.0	91	0.1	151	0.1	31	0 22.8	0 22.8	0 21.7	31	0.1	91	0.2	151	0.4
32	0 08.0	0 08.0	0 07.6	32	0.0	92	0.1	152	0.1	32	0 23.0	0 23.1	0 22.0	32	0.1	92	0.2	152	0.4
33	0 08.3	0 08.3	0 07.9	33	0.0	93	0.1	153	0.1	33	0 23.3	0 23.3	0 22.2	33	0.1	93	0.2	153	0.4
34	0 08.5	0 08.5	0 08.1	34	0.0	94	0.1	154	0.1	34	0 23.5	0 23.6	0 22.4	34	0.1	94	0.2	154	0.4
35	0 08.8	0 08.8	0 08.4	35	0.0	95	0.1	155	0.1	35	0 23.8	0 23.8	0 22.7	35	0.1	95	0.2	155	0.4
36	0 09.0	0 09.0	0 08.6	36	0.0	96	0.1	156	0.1	36	0 24.0	0 24.1	0 22.9	36	0.1	96	0.2	156	0.4
37	0 09.3	0 09.3	0 08.8	37	0.0	97	0.1	157	0.1	37	0 24.3	0 24.3	0 23.1	37	0.1	97	0.2	157	0.4
38	0 09.5	0 09.5	0 09.1	38	0.0	98	0.1	158	0.1	38	0 24.5	0 24.6	0 23.4	38	0.1	98	0.2	158	0.4
39	0 09.8	0 09.8	0 09.3	39	0.0	99	0.1	159	0.1	39	0 24.8	0 24.8	0 23.6	39	0.1	99	0.2	159	0.4
40	0 10.0	0 10.0	0 09.5	40	0.0	100	0.1	160	0.1	40	0 25.0	0 25.1	0 23.9	40	0.1	100	0.3	160	0.4
41	0 10.3	0 10.3	0 09.8	41	0.0	101	0.1	161	0.1	41	0 25.3	0 25.3	0 24.1	41	0.1	101	0.3	161	0.4
42	0 10.5	0 10.5	0 10.0	42	0.0	102	0.1	162	0.1	42	0 25.5	0 25.6	0 24.3	42	0.1	102	0.3	162	0.4
43	0 10.8	0 10.8	0 10.3	43	0.0	103	0.1	163	0.1	43	0 25.8	0 25.8	0 24.6	43	0.1	103	0.3	163	0.4
44	0 11.0	0 11.0	0 10.5	44	0.0	104	0.1	164	0.1	44	0 26.0	0 26.1	0 24.8	44	0.1	104	0.3	164	0.4
45	0 11.3	0 11.3	0 10.7	45	0.0	105	0.1	165	0.1	45	0 26.3	0 26.3	0 25.1	45	0.1	105	0.3	165	0.4
46	0 11.5	0 11.5	0 11.0	46	0.0	106	0.1	166	0.1	46	0 26.5	0 26.6	0 25.3	46	0.1	106	0.3	166	0.4
47	0 11.8	0 11.8	0 11.2	47	0.0	107	0.1	167	0.1	47	0 26.8	0 26.8	0 25.5	47	0.1	107	0.3	167	0.4
48	0 12.0	0 12.0	0 11.5	48	0.0	108	0.1	168	0.1	48	0 27.0	0 27.1	0 25.8	48	0.1	108	0.3	168	0.4
49	0 12.3	0 12.3	0 11.7	49	0.0	109	0.1	169	0.1	49	0 27.3	0 27.3	0 26.0	49	0.1	109	0.3	169	0.4
50	0 12.5	0 12.5	0 11.9	50	0.0	110	0.1	170	0.1	50	0 27.5	0 27.6	0 26.2	50	0.1	110	0.3	170	0.4
51	0 12.8	0 12.8	0 12.2	51	0.0	111	0.1	171	0.1	51	0 27.8	0 27.8	0 26.5	51	0.1	111	0.3	171	0.4
52	0 13.0	0 13.0	0 12.4	52	0.0	112	0.1	172	0.1	52	0 28.0	0 28.1	0 26.7	52	0.1	112	0.3	172	0.4
53	0 13.3	0 13.3	0 12.6	53	0.0	113	0.1	173	0.1	53	0 28.3	0 28.3	0 27.0	53	0.1	113	0.3	173	0.4
54	0 13.5	0 13.5	0 12.9	54	0.0	114	0.1	174	0.1	54	0 28.5	0 28.6	0 27.2	54	0.1	114	0.3	174	0.4
55	0 13.8	0 13.8	0 13.1	55	0.0	115	0.1	175	0.1	55	0 28.8	0 28.8	0 27.4	55	0.1	115	0.3	175	0.4
56	0 14.0	0 14.0	0 13.4	56	0.0	116	0.1	176	0.1	56	0 29.0	0 29.1	0 27.7	56	0.1	116	0.3	176	0.4
57	0 14.3	0 14.3	0 13.6	57	0.0	117	0.1	177	0.1	57	0 29.3	0 29.3	0 27.9	57	0.1	117	0.3	177	0.4
58	0 14.5	0 14.5	0 13.8	58	0.0	118	0.1	178	0.1	58	0 29.5	0 29.6	0 28.2	58	0.1	118	0.3	178	0.4
59	0 14.8	0 14.8	0 14.1	59	0.0	119	0.1	179	0.1	59	0 29.8	0 29.8	0 28.4	59	0.1	119	0.3	179	0.4
60	0 15.0	0 15.0	0 14.3	60	0.1	120	0.1	180	0.2	60	0 30.0	0 30.1	0 28.6	60	0.2	120	0.3	180	0.5

Sec.	SUN PLANET	☿	MOON	code corr'n	code corr'n	code corr'n	Sec.	SUN PLANET	☿	MOON	code corr'n	code corr'n	code corr'n
0	0 30.0	0 30.1	0 28.6	0 0.0	60 0.3	120 0.5	0	0 45.0	0 45.1	0 43.0	0 0.0	60 0.4	120 0.7
1	0 30.3	0 30.3	0 28.9	1 0.0	61 0.3	121 0.5	1	0 45.3	0 45.4	0 43.2	1 0.0	61 0.4	121 0.7
2	0 30.5	0 30.6	0 29.1	2 0.0	62 0.3	122 0.5	2	0 45.5	0 45.6	0 43.4	2 0.0	62 0.4	122 0.7
3	0 30.8	0 30.8	0 29.3	3 0.0	63 0.3	123 0.5	3	0 45.8	0 45.9	0 43.7	3 0.0	63 0.4	123 0.7
4	0 31.0	0 31.1	0 29.6	4 0.0	64 0.3	124 0.5	4	0 46.0	0 46.1	0 43.9	4 0.0	64 0.4	124 0.7
5	0 31.3	0 31.3	0 29.8	5 0.0	65 0.3	125 0.5	5	0 46.3	0 46.4	0 44.1	5 0.0	65 0.4	125 0.7
6	0 31.5	0 31.6	0 30.1	6 0.0	66 0.3	126 0.5	6	0 46.5	0 46.6	0 44.4	6 0.0	66 0.4	126 0.7
7	0 31.8	0 31.8	0 30.3	7 0.0	67 0.3	127 0.5	7	0 46.8	0 46.9	0 44.6	7 0.0	67 0.4	127 0.7
8	0 32.0	0 32.1	0 30.5	8 0.0	68 0.3	128 0.5	8	0 47.0	0 47.1	0 44.9	8 0.0	68 0.4	128 0.7
9	0 32.3	0 32.3	0 30.8	9 0.0	69 0.3	129 0.5	9	0 47.3	0 47.4	0 45.1	9 0.1	69 0.4	129 0.8
10	0 32.5	0 32.6	0 31.0	10 0.0	70 0.3	130 0.5	10	0 47.5	0 47.6	0 45.3	10 0.1	70 0.4	130 0.8
11	0 32.8	0 32.8	0 31.3	11 0.0	71 0.3	131 0.5	11	0 47.8	0 47.9	0 45.6	11 0.1	71 0.4	131 0.8
12	0 33.0	0 33.1	0 31.5	12 0.1	72 0.3	132 0.6	12	0 48.0	0 48.1	0 45.8	12 0.1	72 0.4	132 0.8
13	0 33.3	0 33.3	0 31.7	13 0.1	73 0.3	133 0.6	13	0 48.3	0 48.4	0 46.1	13 0.1	73 0.4	133 0.8
14	0 33.5	0 33.6	0 32.0	14 0.1	74 0.3	134 0.6	14	0 48.5	0 48.6	0 46.3	14 0.1	74 0.4	134 0.8
15	0 33.8	0 33.8	0 32.2	15 0.1	75 0.3	135 0.6	15	0 48.8	0 48.9	0 46.5	15 0.1	75 0.4	135 0.8
16	0 34.0	0 34.1	0 32.5	16 0.1	76 0.3	136 0.6	16	0 49.0	0 49.1	0 46.8	16 0.1	76 0.4	136 0.8
17	0 34.3	0 34.3	0 32.7	17 0.1	77 0.3	137 0.6	17	0 49.3	0 49.4	0 47.0	17 0.1	77 0.4	137 0.8
18	0 34.5	0 34.6	0 32.9	18 0.1	78 0.3	138 0.6	18	0 49.5	0 49.6	0 47.2	18 0.1	78 0.5	138 0.8
19	0 34.8	0 34.8	0 33.2	19 0.1	79 0.3	139 0.6	19	0 49.8	0 49.9	0 47.5	19 0.1	79 0.5	139 0.8
20	0 35.0	0 35.1	0 33.4	20 0.1	80 0.3	140 0.6	20	0 50.0	0 50.1	0 47.7	20 0.1	80 0.5	140 0.8
21	0 35.3	0 35.3	0 33.6	21 0.1	81 0.3	141 0.6	21	0 50.3	0 50.4	0 48.0	21 0.1	81 0.5	141 0.8
22	0 35.5	0 35.6	0 33.9	22 0.1	82 0.3	142 0.6	22	0 50.5	0 50.6	0 48.2	22 0.1	82 0.5	142 0.8
23	0 35.8	0 35.8	0 34.1	23 0.1	83 0.3	143 0.6	23	0 50.8	0 50.9	0 48.4	23 0.1	83 0.5	143 0.8
24	0 36.0	0 36.1	0 34.4	24 0.1	84 0.4	144 0.6	24	0 51.0	0 51.1	0 48.7	24 0.1	84 0.5	144 0.8
25	0 36.3	0 36.3	0 34.6	25 0.1	85 0.4	145 0.6	25	0 51.3	0 51.4	0 48.9	25 0.1	85 0.5	145 0.8
26	0 36.5	0 36.6	0 34.8	26 0.1	86 0.4	146 0.6	26	0 51.5	0 51.6	0 49.2	26 0.2	86 0.5	146 0.9
27	0 36.8	0 36.9	0 35.1	27 0.1	87 0.4	147 0.6	27	0 51.8	0 51.9	0 49.4	27 0.2	87 0.5	147 0.9
28	0 37.0	0 37.1	0 35.3	28 0.1	88 0.4	148 0.6	28	0 52.0	0 52.1	0 49.6	28 0.2	88 0.5	148 0.9
29	0 37.3	0 37.4	0 35.6	29 0.1	89 0.4	149 0.6	29	0 52.3	0 52.4	0 49.9	29 0.2	89 0.5	149 0.9
30	0 37.5	0 37.6	0 35.8	30 0.1	90 0.4	150 0.6	30	0 52.5	0 52.6	0 50.1	30 0.2	90 0.5	150 0.9
31	0 37.8	0 37.9	0 36.0	31 0.1	91 0.4	151 0.6	31	0 52.8	0 52.9	0 50.3	31 0.2	91 0.5	151 0.9
32	0 38.0	0 38.1	0 36.3	32 0.1	92 0.4	152 0.6	32	0 53.0	0 53.1	0 50.6	32 0.2	92 0.5	152 0.9
33	0 38.3	0 38.4	0 36.5	33 0.1	93 0.4	153 0.6	33	0 53.3	0 53.4	0 50.8	33 0.2	93 0.5	153 0.9
34	0 38.5	0 38.6	0 36.7	34 0.1	94 0.4	154 0.6	34	0 53.5	0 53.6	0 51.1	34 0.2	94 0.5	154 0.9
35	0 38.8	0 38.9	0 37.0	35 0.1	95 0.4	155 0.6	35	0 53.8	0 53.9	0 51.3	35 0.2	95 0.6	155 0.9
36	0 39.0	0 39.1	0 37.2	36 0.2	96 0.4	156 0.7	36	0 54.0	0 54.1	0 51.5	36 0.2	96 0.6	156 0.9
37	0 39.3	0 39.4	0 37.5	37 0.2	97 0.4	157 0.7	37	0 54.3	0 54.4	0 51.8	37 0.2	97 0.6	157 0.9
38	0 39.5	0 39.6	0 37.7	38 0.2	98 0.4	158 0.7	38	0 54.5	0 54.6	0 52.0	38 0.2	98 0.6	158 0.9
39	0 39.8	0 39.9	0 37.9	39 0.2	99 0.4	159 0.7	39	0 54.8	0 54.9	0 52.3	39 0.2	99 0.6	159 0.9
40	0 40.0	0 40.1	0 38.2	40 0.2	100 0.4	160 0.7	40	0 55.0	0 55.2	0 52.5	40 0.2	100 0.6	160 0.9
41	0 40.3	0 40.4	0 38.4	41 0.2	101 0.4	161 0.7	41	0 55.3	0 55.4	0 52.7	41 0.2	101 0.6	161 0.9
42	0 40.5	0 40.6	0 38.7	42 0.2	102 0.4	162 0.7	42	0 55.5	0 55.7	0 53.0	42 0.2	102 0.6	162 0.9
43	0 40.8	0 40.9	0 38.9	43 0.2	103 0.4	163 0.7	43	0 55.8	0 55.9	0 53.2	43 0.3	103 0.6	163 1.0
44	0 41.0	0 41.1	0 39.1	44 0.2	104 0.4	164 0.7	44	0 56.0	0 56.2	0 53.4	44 0.3	104 0.6	164 1.0
45	0 41.3	0 41.4	0 39.4	45 0.2	105 0.4	165 0.7	45	0 56.3	0 56.4	0 53.7	45 0.3	105 0.6	165 1.0
46	0 41.5	0 41.6	0 39.6	46 0.2	106 0.4	166 0.7	46	0 56.5	0 56.7	0 53.9	46 0.3	106 0.6	166 1.0
47	0 41.8	0 41.9	0 39.8	47 0.2	107 0.4	167 0.7	47	0 56.8	0 56.9	0 54.2	47 0.3	107 0.6	167 1.0
48	0 42.0	0 42.1	0 40.1	48 0.2	108 0.5	168 0.7	48	0 57.0	0 57.2	0 54.4	48 0.3	108 0.6	168 1.0
49	0 42.3	0 42.4	0 40.3	49 0.2	109 0.5	169 0.7	49	0 57.3	0 57.4	0 54.6	49 0.3	109 0.6	169 1.0
50	0 42.5	0 42.6	0 40.6	50 0.2	110 0.5	170 0.7	50	0 57.5	0 57.7	0 54.9	50 0.3	110 0.6	170 1.0
51	0 42.8	0 42.9	0 40.8	51 0.2	111 0.5	171 0.7	51	0 57.8	0 57.9	0 55.1	51 0.3	111 0.6	171 1.0
52	0 43.0	0 43.1	0 41.0	52 0.2	112 0.5	172 0.7	52	0 58.0	0 58.2	0 55.4	52 0.3	112 0.7	172 1.0
53	0 43.3	0 43.4	0 41.3	53 0.2	113 0.5	173 0.7	53	0 58.3	0 58.4	0 55.6	53 0.3	113 0.7	173 1.0
54	0 43.5	0 43.6	0 41.5	54 0.2	114 0.5	174 0.7	54	0 58.5	0 58.7	0 55.8	54 0.3	114 0.7	174 1.0
55	0 43.8	0 43.9	0 41.8	55 0.2	115 0.5	175 0.7	55	0 58.8	0 58.9	0 56.1	55 0.3	115 0.7	175 1.0
56	0 44.0	0 44.1	0 42.0	56 0.2	116 0.5	176 0.7	56	0 59.0	0 59.2	0 56.3	56 0.3	116 0.7	176 1.0
57	0 44.3	0 44.4	0 42.2	57 0.2	117 0.5	177 0.7	57	0 59.3	0 59.4	0 56.6	57 0.3	117 0.7	177 1.0
58	0 44.5	0 44.6	0 42.5	58 0.2	118 0.5	178 0.7	58	0 59.5	0 59.7	0 56.8	58 0.3	118 0.7	178 1.0
59	0 44.8	0 44.9	0 42.7	59 0.2	119 0.5	179 0.7	59	0 59.8	0 59.9	0 57.0	59 0.3	119 0.7	179 1.0
60	0 45.0	0 45.1	0 43.0	60 0.3	120 0.5	180 0.8	60	1 00.0	1 00.2	0 57.3	60 0.4	120 0.7	180 1.1

Sec.	SUN PLANET	☿	MOON	code corr'n	code corr'n	code corr'n	Sec.	SUN PLANET	☿	MOON	code corr'n	code corr'n	code corr'n
0	1 00.0	1 00.2	0 57.3	0 0.0	60 0.5	120 0.9	0	1 15.0	1 15.2	1 11.6	0 0.0	60 0.6	120 1.1
1	1 00.3	1 00.4	0 57.5	1 0.0	61 0.5	121 0.9	1	1 15.3	1 15.5	1 11.8	1 0.0	61 0.6	121 1.1
2	1 00.5	1 00.7	0 57.7	2 0.0	62 0.5	122 0.9	2	1 15.5	1 15.7	1 12.1	2 0.0	62 0.6	122 1.1
3	1 00.8	1 00.9	0 58.0	3 0.0	63 0.5	123 0.9	3	1 15.8	1 16.0	1 12.3	3 0.0	63 0.6	123 1.1
4	1 01.0	1 01.2	0 58.2	4 0.0	64 0.5	124 0.9	4	1 16.0	1 16.2	1 12.5	4 0.0	64 0.6	124 1.1
5	1 01.3	1 01.4	0 58.5	5 0.0	65 0.5	125 0.9	5	1 16.3	1 16.5	1 12.8	5 0.0	65 0.6	125 1.1
6	1 01.5	1 01.7	0 58.7	6 0.0	66 0.5	126 0.9	6	1 16.5	1 16.7	1 13.0	6 0.1	66 0.6	126 1.2
7	1 01.8	1 01.9	0 58.9	7 0.1	67 0.5	127 1.0	7	1 16.8	1 17.0	1 13.3	7 0.1	67 0.6	127 1.2
8	1 02.0	1 02.2	0 59.2	8 0.1	68 0.5	128 1.0	8	1 17.0	1 17.2	1 13.5	8 0.1	68 0.6	128 1.2
9	1 02.3	1 02.4	0 59.4	9 0.1	69 0.5	129 1.0	9	1 17.3	1 17.5	1 13.7	9 0.1	69 0.6	129 1.2
10	1 02.5	1 02.7	0 59.7	10 0.1	70 0.5	130 1.0	10	1 17.5	1 17.7	1 14.0	10 0.1	70 0.6	130 1.2
11	1 02.8	1 02.9	0 59.9	11 0.1	71 0.5	131 1.0	11	1 17.8	1 18.0	1 14.2	11 0.1	71 0.7	131 1.2
12	1 03.0	1 03.2	1 00.1	12 0.1	72 0.5	132 1.0	12	1 18.0	1 18.2	1 14.4	12 0.1	72 0.7	132 1.2
13	1 03.3	1 03.4	1 00.4	13 0.1	73 0.5	133 1.0	13	1 18.3	1 18.5	1 14.7	13 0.1	73 0.7	133 1.2
14	1 03.5	1 03.7	1 00.6	14 0.1	74 0.6	134 1.0	14	1 18.5	1 18.7	1 14.9	14 0.1	74 0.7	134 1.2
15	1 03.8	1 03.9	1 00.8	15 0.1	75 0.6	135 1.0	15	1 18.8	1 19.0	1 15.2	15 0.1	75 0.7	135 1.2
16	1 04.0	1 04.2	1 01.1	16 0.1	76 0.6	136 1.0	16	1 19.0	1 19.2	1 15.4	16 0.1	76 0.7	136 1.2
17	1 04.3	1 04.4	1 01.3	17 0.1	77 0.6	137 1.0	17	1 19.3	1 19.5	1 15.6	17 0.2	77 0.7	137 1.3
18	1 04.5	1 04.7	1 01.6	18 0.1	78 0.6	138 1.0	18	1 19.5	1 19.7	1 15.9	18 0.2	78 0.7	138 1.3
19	1 04.8	1 04.9	1 01.8	19 0.1	79 0.6	139 1.0	19	1 19.8	1 20.0	1 16.1	19 0.2	79 0.7	139 1.3
20	1 05.0	1 05.2	1 02.0	20 0.2	80 0.6	140 1.1	20	1 20.0	1 20.2	1 16.4	20 0.2	80 0.7	140 1.3
21	1 05.3	1 05.4	1 02.3	21 0.2	81 0.6	141 1.1	21	1 20.3	1 20.5	1 16.6	21 0.2	81 0.7	141 1.3
22	1 05.5	1 05.7	1 02.5	22 0.2	82 0.6	142 1.1	22	1 20.5	1 20.7	1 16.8	22 0.2	82 0.8	142 1.3
23	1 05.8	1 05.9	1 02.8	23 0.2	83 0.6	143 1.1	23	1 20.8	1 21.0	1 17.1	23 0.2	83 0.8	143 1.3
24	1 06.0	1 06.2	1 03.0	24 0.2	84 0.6	144 1.1	24	1 21.0	1 21.2	1 17.3	24 0.2	84 0.8	144 1.3
25	1 06.3	1 06.4	1 03.2	25 0.2	85 0.6	145 1.1	25	1 21.3	1 21.5	1 17.5	25 0.2	85 0.8	145 1.3
26	1 06.5	1 06.7	1 03.5	26 0.2	86 0.6	146 1.1	26	1 21.5	1 21.7	1 17.8	26 0.2	86 0.8	146 1.3
27	1 06.8	1 06.9	1 03.7	27 0.2	87 0.7	147 1.1	27	1 21.8	1 22.0	1 18.0	27 0.2	87 0.8	147 1.3
28	1 07.0	1 07.2	1 03.9	28 0.2	88 0.7	148 1.1	28	1 22.0	1 22.2	1 18.3	28 0.3	88 0.8	148 1.4
29	1 07.3	1 07.4	1 04.2	29 0.2	89 0.7	149 1.1	29	1 22.3	1 22.5	1 18.5	29 0.3	89 0.8	149 1.4
30	1 07.5	1 07.7	1 04.4	30 0.2	90 0.7	150 1.1	30	1 22.5	1 22.7	1 18.7	30 0.3	90 0.8	150 1.4
31	1 07.8	1 07.9	1 04.7	31 0.2	91 0.7	151 1.1	31	1 22.8	1 23.0	1 19.0	31 0.3	91 0.8	151 1.4
32	1 08.0	1 08.2	1 04.9	32 0.2	92 0.7	152 1.1	32	1 23.0	1 23.2	1 19.2	32 0.3	92 0.8	152 1.4
33	1 08.3	1 08.4	1 05.1	33 0.2	93 0.7	153 1.1	33	1 23.3	1 23.5	1 19.5	33 0.3	93 0.9	153 1.4
34	1 08.5	1 08.7	1 05.4	34 0.3	94 0.7	154 1.2	34	1 23.5	1 23.7	1 19.7	34 0.3	94 0.9	154 1.4
35	1 08.8	1 08.9	1 05.6	35 0.3	95 0.7	155 1.2	35	1 23.8	1 24.0	1 19.9	35 0.3	95 0.9	155 1.4
36	1 09.0	1 09.2	1 05.9	36 0.3	96 0.7	156 1.2	36	1 24.0	1 24.2	1 20.2	36 0.3	96 0.9	156 1.4
37	1 09.3	1 09.4	1 06.1	37 0.3	97 0.7	157 1.2	37	1 24.3	1 24.5	1 20.4	37 0.3	97 0.9	157 1.4
38	1 09.5	1 09.7	1 06.3	38 0.3	98 0.7	158 1.2	38	1 24.5	1 24.7	1 20.7	38 0.3	98 0.9	158 1.4
39	1 09.8	1 09.9	1 06.6	39 0.3	99 0.7	159 1.2	39	1 24.8	1 25.0	1 20.9	39 0.4	99 0.9	159 1.5
40	1 10.0	1 10.2	1 06.8	40 0.3	100 0.8	160 1.2	40	1 25.0	1 25.2	1 21.1	40 0.4	100 0.9	160 1.5
41	1 10.3	1 10.4	1 07.0	41 0.3	101 0.8	161 1.2	41	1 25.3	1 25.5	1 21.4	41 0.4	101 0.9	161 1.5
42	1 10.5	1 10.7	1 07.3	42 0.3	102 0.8	162 1.2	42	1 25.5	1 25.7	1 21.6	42 0.4	102 0.9	162 1.5
43	1 10.8	1 10.9	1 07.5	43 0.3	103 0.8	163 1.2	43	1 25.8	1 26.0	1 21.8	43 0.4	103 0.9	163 1.5
44	1 11.0	1 11.2	1 07.8	44 0.3	104 0.8	164 1.2	44	1 26.0	1 26.2	1 22.1	44 0.4	104 1.0	164 1.5
45	1 11.3	1 11.4	1 08.0	45 0.3	105 0.8	165 1.2	45	1 26.3	1 26.5	1 22.3	45 0.4	105 1.0	165 1.5
46	1 11.5	1 11.7	1 08.2	46 0.3	106 0.8	166 1.2	46	1 26.5	1 26.7	1 22.6	46 0.4	106 1.0	166 1.5
47	1 11.8	1 11.9	1 08.5	47 0.4	107 0.8	167 1.3	47	1 26.8	1 27.0	1 22.8	47 0.4	107 1.0	167 1.5
48	1 12.0	1 12.2	1 08.7	48 0.4	108 0.8	168 1.3	48	1 27.0	1 27.2	1 23.0	48 0.4	108 1.0	168 1.5
49	1 12.3	1 12.4	1 09.0	49 0.4	109 0.8	169 1.3	49	1 27.3	1 27.5	1 23.3	49 0.4	109 1.0	169 1.5
50	1 12.5	1 12.7	1 09.2	50 0.4	110 0.8	170 1.3	50	1 27.5	1 27.7	1 23.5	50 0.5	110 1.0	170 1.6
51	1 12.8	1 12.9	1 09.4	51 0.4	111 0.8	171 1.3	51	1 27.8	1 28.0	1 23.8	51 0.5	111 1.0	171 1.6
52	1 13.0	1 13.2	1 09.7	52 0.4	112 0.8	172 1.3	52	1 28.0	1 28.2	1 24.0	52 0.5	112 1.0	172 1.6
53	1 13.3	1 13.5	1 09.9	53 0.4	113 0.8	173 1.3	53	1 28.3	1 28.5	1 24.2	53 0.5	113 1.0	173 1.6
54	1 13.5	1 13.7	1 10.2	54 0.4	114 0.9	174 1.3	54	1 28.5	1 28.7	1 24.5	54 0.5	114 1.0	174 1.6
55	1 13.8	1 14.0	1 10.4	55 0.4	115 0.9	175 1.3	55	1 28.8	1 29.0	1 24.7	55 0.5	115 1.1	175 1.6
56	1 14.0	1 14.2	1 10.6	56 0.4	116 0.9	176 1.3	56	1 29.0	1 29.2	1 24.9	56 0.5	116 1.1	176 1.6
57	1 14.3	1 14.5	1 10.9	57 0.4	117 0.9	177 1.3	57	1 29.3	1 29.5	1 25.2	57 0.5	117 1.1	177 1.6
58	1 14.5	1 14.7	1 11.1	58 0.4	118 0.9	178 1.3	58	1 29.5	1 29.7	1 25.4	58 0.5	118 1.1	178 1.6
59	1 14.8	1 15.0	1 11.3	59 0.4	119 0.9	179 1.3	59	1 29.8	1 30.0	1 25.7	59 0.5	119 1.1	179 1.6
60	1 15.0	1 15.2	1 11.6	60 0.5	120 0.9	180 1.4	60	1 30.0	1 30.2	1 25.9	60 0.6	120 1.1	180 1.7

Sec.	SUN PLANET	γ	MOON	code corr'n	code corr'n	code corr'n	Sec.	SUN PLANET	γ	MOON	code corr'n	code corr'n	code corr'n
0	1 30.0	1 30.2	1 25.9	0 0.0	60 0.7	120 1.3	0	1 45.0	1 45.3	1 40.2	0 0.0	60 0.8	120 1.5
1	1 30.3	1 30.5	1 26.1	1 0.0	61 0.7	121 1.3	1	1 45.3	1 45.5	1 40.5	1 0.0	61 0.8	121 1.5
2	1 30.5	1 30.7	1 26.4	2 0.0	62 0.7	122 1.3	2	1 45.5	1 45.8	1 40.7	2 0.0	62 0.8	122 1.5
3	1 30.8	1 31.0	1 26.6	3 0.0	63 0.7	123 1.3	3	1 45.8	1 46.0	1 40.9	3 0.0	63 0.8	123 1.5
4	1 31.0	1 31.2	1 26.9	4 0.0	64 0.7	124 1.3	4	1 46.0	1 46.3	1 41.2	4 0.1	64 0.8	124 1.6
5	1 31.3	1 31.5	1 27.1	5 0.1	65 0.7	125 1.4	5	1 46.3	1 46.5	1 41.4	5 0.1	65 0.8	125 1.6
6	1 31.5	1 31.8	1 27.3	6 0.1	66 0.7	126 1.4	6	1 46.5	1 46.8	1 41.6	6 0.1	66 0.8	126 1.6
7	1 31.8	1 32.0	1 27.6	7 0.1	67 0.7	127 1.4	7	1 46.8	1 47.0	1 41.9	7 0.1	67 0.8	127 1.6
8	1 32.0	1 32.3	1 27.8	8 0.1	68 0.7	128 1.4	8	1 47.0	1 47.3	1 42.1	8 0.1	68 0.9	128 1.6
9	1 32.3	1 32.5	1 28.0	9 0.1	69 0.7	129 1.4	9	1 47.3	1 47.5	1 42.4	9 0.1	69 0.9	129 1.6
10	1 32.5	1 32.8	1 28.3	10 0.1	70 0.8	130 1.4	10	1 47.5	1 47.8	1 42.6	10 0.1	70 0.9	130 1.6
11	1 32.8	1 33.0	1 28.5	11 0.1	71 0.8	131 1.4	11	1 47.8	1 48.0	1 42.8	11 0.1	71 0.9	131 1.6
12	1 33.0	1 33.3	1 28.8	12 0.1	72 0.8	132 1.4	12	1 48.0	1 48.3	1 43.1	12 0.2	72 0.9	132 1.7
13	1 33.3	1 33.5	1 29.0	13 0.1	73 0.8	133 1.4	13	1 48.3	1 48.5	1 43.3	13 0.2	73 0.9	133 1.7
14	1 33.5	1 33.8	1 29.2	14 0.2	74 0.8	134 1.5	14	1 48.5	1 48.8	1 43.6	14 0.2	74 0.9	134 1.7
15	1 33.8	1 34.0	1 29.5	15 0.2	75 0.8	135 1.5	15	1 48.8	1 49.0	1 43.8	15 0.2	75 0.9	135 1.7
16	1 34.0	1 34.3	1 29.7	16 0.2	76 0.8	136 1.5	16	1 49.0	1 49.3	1 44.0	16 0.2	76 1.0	136 1.7
17	1 34.3	1 34.5	1 30.0	17 0.2	77 0.8	137 1.5	17	1 49.3	1 49.5	1 44.3	17 0.2	77 1.0	137 1.7
18	1 34.5	1 34.8	1 30.2	18 0.2	78 0.8	138 1.5	18	1 49.5	1 49.8	1 44.5	18 0.2	78 1.0	138 1.7
19	1 34.8	1 35.0	1 30.4	19 0.2	79 0.9	139 1.5	19	1 49.8	1 50.1	1 44.8	19 0.2	79 1.0	139 1.7
20	1 35.0	1 35.3	1 30.7	20 0.2	80 0.9	140 1.5	20	1 50.0	1 50.3	1 45.0	20 0.3	80 1.0	140 1.8
21	1 35.3	1 35.5	1 30.9	21 0.2	81 0.9	141 1.5	21	1 50.3	1 50.6	1 45.2	21 0.3	81 1.0	141 1.8
22	1 35.5	1 35.8	1 31.1	22 0.2	82 0.9	142 1.5	22	1 50.5	1 50.8	1 45.5	22 0.3	82 1.0	142 1.8
23	1 35.8	1 36.0	1 31.4	23 0.2	83 0.9	143 1.5	23	1 50.8	1 51.1	1 45.7	23 0.3	83 1.0	143 1.8
24	1 36.0	1 36.3	1 31.6	24 0.3	84 0.9	144 1.6	24	1 51.0	1 51.3	1 45.9	24 0.3	84 1.1	144 1.8
25	1 36.3	1 36.5	1 31.9	25 0.3	85 0.9	145 1.6	25	1 51.3	1 51.6	1 46.2	25 0.3	85 1.1	145 1.8
26	1 36.5	1 36.8	1 32.1	26 0.3	86 0.9	146 1.6	26	1 51.5	1 51.8	1 46.4	26 0.3	86 1.1	146 1.8
27	1 36.8	1 37.0	1 32.3	27 0.3	87 0.9	147 1.6	27	1 51.8	1 52.1	1 46.7	27 0.3	87 1.1	147 1.8
28	1 37.0	1 37.3	1 32.6	28 0.3	88 1.0	148 1.6	28	1 52.0	1 52.3	1 46.9	28 0.4	88 1.1	148 1.9
29	1 37.3	1 37.5	1 32.8	29 0.3	89 1.0	149 1.6	29	1 52.3	1 52.6	1 47.1	29 0.4	89 1.1	149 1.9
30	1 37.5	1 37.8	1 33.1	30 0.3	90 1.0	150 1.6	30	1 52.5	1 52.8	1 47.4	30 0.4	90 1.1	150 1.9
31	1 37.8	1 38.0	1 33.3	31 0.3	91 1.0	151 1.6	31	1 52.8	1 53.1	1 47.6	31 0.4	91 1.1	151 1.9
32	1 38.0	1 38.3	1 33.5	32 0.3	92 1.0	152 1.6	32	1 53.0	1 53.3	1 47.9	32 0.4	92 1.2	152 1.9
33	1 38.3	1 38.5	1 33.8	33 0.4	93 1.0	153 1.7	33	1 53.3	1 53.6	1 48.1	33 0.4	93 1.2	153 1.9
34	1 38.5	1 38.8	1 34.0	34 0.4	94 1.0	154 1.7	34	1 53.5	1 53.8	1 48.3	34 0.4	94 1.2	154 1.9
35	1 38.8	1 39.0	1 34.3	35 0.4	95 1.0	155 1.7	35	1 53.8	1 54.1	1 48.6	35 0.4	95 1.2	155 1.9
36	1 39.0	1 39.3	1 34.5	36 0.4	96 1.0	156 1.7	36	1 54.0	1 54.3	1 48.8	36 0.5	96 1.2	156 2.0
37	1 39.3	1 39.5	1 34.7	37 0.4	97 1.1	157 1.7	37	1 54.3	1 54.6	1 49.0	37 0.5	97 1.2	157 2.0
38	1 39.5	1 39.8	1 35.0	38 0.4	98 1.1	158 1.7	38	1 54.5	1 54.8	1 49.3	38 0.5	98 1.2	158 2.0
39	1 39.8	1 40.0	1 35.2	39 0.4	99 1.1	159 1.7	39	1 54.8	1 55.1	1 49.5	39 0.5	99 1.2	159 2.0
40	1 40.0	1 40.3	1 35.4	40 0.4	100 1.1	160 1.7	40	1 55.0	1 55.3	1 49.8	40 0.5	100 1.3	160 2.0
41	1 40.3	1 40.5	1 35.7	41 0.4	101 1.1	161 1.7	41	1 55.3	1 55.6	1 50.0	41 0.5	101 1.3	161 2.0
42	1 40.5	1 40.8	1 35.9	42 0.5	102 1.1	162 1.8	42	1 55.5	1 55.8	1 50.2	42 0.5	102 1.3	162 2.0
43	1 40.8	1 41.0	1 36.2	43 0.5	103 1.1	163 1.8	43	1 55.8	1 56.1	1 50.5	43 0.5	103 1.3	163 2.0
44	1 41.0	1 41.3	1 36.4	44 0.5	104 1.1	164 1.8	44	1 56.0	1 56.3	1 50.7	44 0.6	104 1.3	164 2.1
45	1 41.3	1 41.5	1 36.6	45 0.5	105 1.1	165 1.8	45	1 56.3	1 56.6	1 51.0	45 0.6	105 1.3	165 2.1
46	1 41.5	1 41.8	1 36.9	46 0.5	106 1.1	166 1.8	46	1 56.5	1 56.8	1 51.2	46 0.6	106 1.3	166 2.1
47	1 41.8	1 42.0	1 37.1	47 0.5	107 1.2	167 1.8	47	1 56.8	1 57.1	1 51.4	47 0.6	107 1.3	167 2.1
48	1 42.0	1 42.3	1 37.4	48 0.5	108 1.2	168 1.8	48	1 57.0	1 57.3	1 51.7	48 0.6	108 1.4	168 2.1
49	1 42.3	1 42.5	1 37.6	49 0.5	109 1.2	169 1.8	49	1 57.3	1 57.6	1 51.9	49 0.6	109 1.4	169 2.1
50	1 42.5	1 42.8	1 37.8	50 0.5	110 1.2	170 1.8	50	1 57.5	1 57.8	1 52.1	50 0.6	110 1.4	170 2.1
51	1 42.8	1 43.0	1 38.1	51 0.6	111 1.2	171 1.9	51	1 57.8	1 58.1	1 52.4	51 0.6	111 1.4	171 2.1
52	1 43.0	1 43.3	1 38.3	52 0.6	112 1.2	172 1.9	52	1 58.0	1 58.3	1 52.6	52 0.7	112 1.4	172 2.2
53	1 43.3	1 43.5	1 38.5	53 0.6	113 1.2	173 1.9	53	1 58.3	1 58.6	1 52.9	53 0.7	113 1.4	173 2.2
54	1 43.5	1 43.8	1 38.8	54 0.6	114 1.2	174 1.9	54	1 58.5	1 58.8	1 53.1	54 0.7	114 1.4	174 2.2
55	1 43.8	1 44.0	1 39.0	55 0.6	115 1.2	175 1.9	55	1 58.8	1 59.1	1 53.3	55 0.7	115 1.4	175 2.2
56	1 44.0	1 44.3	1 39.3	56 0.6	116 1.3	176 1.9	56	1 59.0	1 59.3	1 53.6	56 0.7	116 1.5	176 2.2
57	1 44.3	1 44.5	1 39.5	57 0.6	117 1.3	177 1.9	57	1 59.3	1 59.6	1 53.8	57 0.7	117 1.5	177 2.2
58	1 44.5	1 44.8	1 39.7	58 0.6	118 1.3	178 1.9	58	1 59.5	1 59.8	1 54.1	58 0.7	118 1.5	178 2.2
59	1 44.8	1 45.0	1 40.0	59 0.6	119 1.3	179 1.9	59	1 59.8	2 00.1	1 54.3	59 0.7	119 1.5	179 2.2
60	1 45.0	1 45.3	1 40.2	60 0.7	120 1.3	180 2.0	60	2 00.0	2 00.3	1 54.5	60 0.8	120 1.5	180 2.3

Sec.	SUN PLANET	°	MOON	code	corr'n	code	corr'n	code	corr'n	Sec.	SUN PLANET	°	MOON	code	corr'n	code	corr'n	code	corr'n	
0	2 00.0	2 00.3	1 54.5	0 0.0	60 0.9	120 1.7	0	2 15.0	2 15.4	2 08.9	0 0.0	60 1.0	120 1.9	0	2 15.0	2 15.4	2 08.9	0 0.0	60 1.0	120 1.9
1	2 00.3	2 00.6	1 54.8	1 0.0	61 0.9	121 1.7	1	2 15.3	2 15.6	2 09.1	1 0.0	61 1.0	121 1.9	1	2 15.3	2 15.6	2 09.1	1 0.0	61 1.0	121 1.9
2	2 00.5	2 00.8	1 55.0	2 0.0	62 0.9	122 1.7	2	2 15.5	2 15.9	2 09.3	2 0.0	62 1.0	122 1.9	2	2 15.5	2 15.9	2 09.3	2 0.0	62 1.0	122 1.9
3	2 00.8	2 01.1	1 55.2	3 0.0	63 0.9	123 1.7	3	2 15.8	2 16.1	2 09.6	3 0.0	63 1.0	123 1.9	3	2 15.8	2 16.1	2 09.6	3 0.0	63 1.0	123 1.9
4	2 01.0	2 01.3	1 55.5	4 0.1	64 0.9	124 1.8	4	2 16.0	2 16.4	2 09.8	4 0.1	64 1.0	124 2.0	4	2 16.0	2 16.4	2 09.8	4 0.1	64 1.0	124 2.0
5	2 01.3	2 01.6	1 55.7	5 0.1	65 0.9	125 1.8	5	2 16.3	2 16.6	2 10.0	5 0.1	65 1.0	125 2.0	5	2 16.3	2 16.6	2 10.0	5 0.1	65 1.0	125 2.0
6	2 01.5	2 01.8	1 56.0	6 0.1	66 0.9	126 1.8	6	2 16.5	2 16.9	2 10.3	6 0.1	66 1.0	126 2.0	6	2 16.5	2 16.9	2 10.3	6 0.1	66 1.0	126 2.0
7	2 01.8	2 02.1	1 56.2	7 0.1	67 0.9	127 1.8	7	2 16.8	2 17.1	2 10.5	7 0.1	67 1.1	127 2.0	7	2 16.8	2 17.1	2 10.5	7 0.1	67 1.1	127 2.0
8	2 02.0	2 02.3	1 56.4	8 0.1	68 1.0	128 1.8	8	2 17.0	2 17.4	2 10.8	8 0.1	68 1.1	128 2.0	8	2 17.0	2 17.4	2 10.8	8 0.1	68 1.1	128 2.0
9	2 02.3	2 02.6	1 56.7	9 0.1	69 1.0	129 1.8	9	2 17.3	2 17.6	2 11.0	9 0.1	69 1.1	129 2.0	9	2 17.3	2 17.6	2 11.0	9 0.1	69 1.1	129 2.0
10	2 02.5	2 02.8	1 56.9	10 0.1	70 1.0	130 1.8	10	2 17.5	2 17.9	2 11.2	10 0.2	70 1.1	130 2.1	10	2 17.5	2 17.9	2 11.2	10 0.2	70 1.1	130 2.1
11	2 02.8	2 03.1	1 57.2	11 0.2	71 1.0	131 1.9	11	2 17.8	2 18.1	2 11.5	11 0.2	71 1.1	131 2.1	11	2 17.8	2 18.1	2 11.5	11 0.2	71 1.1	131 2.1
12	2 03.0	2 03.3	1 57.4	12 0.2	72 1.0	132 1.9	12	2 18.0	2 18.4	2 11.7	12 0.2	72 1.1	132 2.1	12	2 18.0	2 18.4	2 11.7	12 0.2	72 1.1	132 2.1
13	2 03.3	2 03.6	1 57.6	13 0.2	73 1.0	133 1.9	13	2 18.3	2 18.6	2 12.0	13 0.2	73 1.2	133 2.1	13	2 18.3	2 18.6	2 12.0	13 0.2	73 1.2	133 2.1
14	2 03.5	2 03.8	1 57.9	14 0.2	74 1.0	134 1.9	14	2 18.5	2 18.9	2 12.2	14 0.2	74 1.2	134 2.1	14	2 18.5	2 18.9	2 12.2	14 0.2	74 1.2	134 2.1
15	2 03.8	2 04.1	1 58.1	15 0.2	75 1.1	135 1.9	15	2 18.8	2 19.1	2 12.4	15 0.2	75 1.2	135 2.1	15	2 18.8	2 19.1	2 12.4	15 0.2	75 1.2	135 2.1
16	2 04.0	2 04.3	1 58.4	16 0.2	76 1.1	136 1.9	16	2 19.0	2 19.4	2 12.7	16 0.3	76 1.2	136 2.2	16	2 19.0	2 19.4	2 12.7	16 0.3	76 1.2	136 2.2
17	2 04.3	2 04.6	1 58.6	17 0.2	77 1.1	137 1.9	17	2 19.3	2 19.6	2 12.9	17 0.3	77 1.2	137 2.2	17	2 19.3	2 19.6	2 12.9	17 0.3	77 1.2	137 2.2
18	2 04.5	2 04.8	1 58.8	18 0.3	78 1.1	138 2.0	18	2 19.5	2 19.9	2 13.1	18 0.3	78 1.2	138 2.2	18	2 19.5	2 19.9	2 13.1	18 0.3	78 1.2	138 2.2
19	2 04.8	2 05.1	1 59.1	19 0.3	79 1.1	139 2.0	19	2 19.8	2 20.1	2 13.4	19 0.3	79 1.3	139 2.2	19	2 19.8	2 20.1	2 13.4	19 0.3	79 1.3	139 2.2
20	2 05.0	2 05.3	1 59.3	20 0.3	80 1.1	140 2.0	20	2 20.0	2 20.4	2 13.6	20 0.3	80 1.3	140 2.2	20	2 20.0	2 20.4	2 13.6	20 0.3	80 1.3	140 2.2
21	2 05.3	2 05.6	1 59.5	21 0.3	81 1.1	141 2.0	21	2 20.3	2 20.6	2 13.9	21 0.3	81 1.3	141 2.2	21	2 20.3	2 20.6	2 13.9	21 0.3	81 1.3	141 2.2
22	2 05.5	2 05.8	1 59.8	22 0.3	82 1.2	142 2.0	22	2 20.5	2 20.9	2 14.1	22 0.3	82 1.3	142 2.2	22	2 20.5	2 20.9	2 14.1	22 0.3	82 1.3	142 2.2
23	2 05.8	2 06.1	2 00.0	23 0.3	83 1.2	143 2.0	23	2 20.8	2 21.1	2 14.3	23 0.4	83 1.3	143 2.3	23	2 20.8	2 21.1	2 14.3	23 0.4	83 1.3	143 2.3
24	2 06.0	2 06.3	2 00.3	24 0.3	84 1.2	144 2.0	24	2 21.0	2 21.4	2 14.6	24 0.4	84 1.3	144 2.3	24	2 21.0	2 21.4	2 14.6	24 0.4	84 1.3	144 2.3
25	2 06.3	2 06.6	2 00.5	25 0.4	85 1.2	145 2.1	25	2 21.3	2 21.6	2 14.8	25 0.4	85 1.3	145 2.3	25	2 21.3	2 21.6	2 14.8	25 0.4	85 1.3	145 2.3
26	2 06.5	2 06.8	2 00.7	26 0.4	86 1.2	146 2.1	26	2 21.5	2 21.9	2 15.1	26 0.4	86 1.4	146 2.3	26	2 21.5	2 21.9	2 15.1	26 0.4	86 1.4	146 2.3
27	2 06.8	2 07.1	2 01.0	27 0.4	87 1.2	147 2.1	27	2 21.8	2 22.1	2 15.3	27 0.4	87 1.4	147 2.3	27	2 21.8	2 22.1	2 15.3	27 0.4	87 1.4	147 2.3
28	2 07.0	2 07.3	2 01.2	28 0.4	88 1.2	148 2.1	28	2 22.0	2 22.4	2 15.5	28 0.4	88 1.4	148 2.3	28	2 22.0	2 22.4	2 15.5	28 0.4	88 1.4	148 2.3
29	2 07.3	2 07.6	2 01.5	29 0.4	89 1.3	149 2.1	29	2 22.3	2 22.6	2 15.8	29 0.5	89 1.4	149 2.4	29	2 22.3	2 22.6	2 15.8	29 0.5	89 1.4	149 2.4
30	2 07.5	2 07.8	2 01.7	30 0.4	90 1.3	150 2.1	30	2 22.5	2 22.9	2 16.0	30 0.5	90 1.4	150 2.4	30	2 22.5	2 22.9	2 16.0	30 0.5	90 1.4	150 2.4
31	2 07.8	2 08.1	2 01.9	31 0.4	91 1.3	151 2.1	31	2 22.8	2 23.1	2 16.2	31 0.5	91 1.4	151 2.4	31	2 22.8	2 23.1	2 16.2	31 0.5	91 1.4	151 2.4
32	2 08.0	2 08.4	2 02.2	32 0.5	92 1.3	152 2.2	32	2 23.0	2 23.4	2 16.5	32 0.5	92 1.5	152 2.4	32	2 23.0	2 23.4	2 16.5	32 0.5	92 1.5	152 2.4
33	2 08.3	2 08.6	2 02.4	33 0.5	93 1.3	153 2.2	33	2 23.3	2 23.6	2 16.7	33 0.5	93 1.5	153 2.4	33	2 23.3	2 23.6	2 16.7	33 0.5	93 1.5	153 2.4
34	2 08.5	2 08.9	2 02.6	34 0.5	94 1.3	154 2.2	34	2 23.5	2 23.9	2 17.0	34 0.5	94 1.5	154 2.4	34	2 23.5	2 23.9	2 17.0	34 0.5	94 1.5	154 2.4
35	2 08.8	2 09.1	2 02.9	35 0.5	95 1.3	155 2.2	35	2 23.8	2 24.1	2 17.2	35 0.6	95 1.5	155 2.5	35	2 23.8	2 24.1	2 17.2	35 0.6	95 1.5	155 2.5
36	2 09.0	2 09.4	2 03.1	36 0.5	96 1.4	156 2.2	36	2 24.0	2 24.4	2 17.4	36 0.6	96 1.5	156 2.5	36	2 24.0	2 24.4	2 17.4	36 0.6	96 1.5	156 2.5
37	2 09.3	2 09.6	2 03.4	37 0.5	97 1.4	157 2.2	37	2 24.3	2 24.6	2 17.7	37 0.6	97 1.5	157 2.5	37	2 24.3	2 24.6	2 17.7	37 0.6	97 1.5	157 2.5
38	2 09.5	2 09.9	2 03.6	38 0.5	98 1.4	158 2.2	38	2 24.5	2 24.9	2 17.9	38 0.6	98 1.6	158 2.5	38	2 24.5	2 24.9	2 17.9	38 0.6	98 1.6	158 2.5
39	2 09.8	2 10.1	2 03.8	39 0.6	99 1.4	159 2.3	39	2 24.8	2 25.1	2 18.2	39 0.6	99 1.6	159 2.5	39	2 24.8	2 25.1	2 18.2	39 0.6	99 1.6	159 2.5
40	2 10.0	2 10.4	2 04.1	40 0.6	100 1.4	160 2.3	40	2 25.0	2 25.4	2 18.4	40 0.6	100 1.6	160 2.5	40	2 25.0	2 25.4	2 18.4	40 0.6	100 1.6	160 2.5
41	2 10.3	2 10.6	2 04.3	41 0.6	101 1.4	161 2.3	41	2 25.3	2 25.6	2 18.6	41 0.6	101 1.6	161 2.5	41	2 25.3	2 25.6	2 18.6	41 0.6	101 1.6	161 2.5
42	2 10.5	2 10.9	2 04.6	42 0.6	102 1.4	162 2.3	42	2 25.5	2 25.9	2 18.9	42 0.7	102 1.6	162 2.6	42	2 25.5	2 25.9	2 18.9	42 0.7	102 1.6	162 2.6
43	2 10.8	2 11.1	2 04.8	43 0.6	103 1.5	163 2.3	43	2 25.8	2 26.1	2 19.1	43 0.7	103 1.6	163 2.6	43	2 25.8	2 26.1	2 19.1	43 0.7	103 1.6	163 2.6
44	2 11.0	2 11.4	2 05.0	44 0.6	104 1.5	164 2.3	44	2 26.0	2 26.4	2 19.3	44 0.7	104 1.6	164 2.6	44	2 26.0	2 26.4	2 19.3	44 0.7	104 1.6	164 2.6
45	2 11.3	2 11.6	2 05.3	45 0.6	105 1.5	165 2.3	45	2 26.3	2 26.7	2 19.6	45 0.7	105 1.7	165 2.6	45	2 26.3	2 26.7	2 19.6	45 0.7	105 1.7	165 2.6
46	2 11.5	2 11.9	2 05.5	46 0.7	106 1.5	166 2.4	46	2 26.5	2 26.9	2 19.8	46 0.7	106 1.7	166 2.6	46	2 26.5	2 26.9	2 19.8	46 0.7	106 1.7	166 2.6
47	2 11.8	2 12.1	2 05.7	47 0.7	107 1.5	167 2.4	47	2 26.8	2 27.2	2 20.1	47 0.7	107 1.7	167 2.6	47	2 26.8	2 27.2	2 20.1	47 0.7	107 1.7	167 2.6
48	2 12.0	2 12.4	2 06.0	48 0.7	108 1.5	168 2.4	48	2 27.0	2 27.4	2 20.3	48 0.8	108 1.7	168 2.7	48	2 27.0	2 27.4	2 20.3	48 0.8	108 1.7	168 2.7
49	2 12.3	2 12.6	2 06.2	49 0.7	109 1.5	169 2.4	49	2 27.3	2 27.7	2 20.5	49 0.8	109 1.7	169 2.7	49	2 27.3	2 27.7	2 20.5	49 0.8	109 1.7	169 2.7
50	2 12.5	2 12.9	2 06.5	50 0.7	110 1.6	170 2.4	50	2 27.5	2 27.9	2 20.8	50 0.8	110 1.7	170 2.7	50	2 27.5	2 27.9	2 20.8	50 0.8	110 1.7	170 2.7
51	2 12.8	2 13.1	2 06.7	51 0.7	111 1.6	171 2.4	51	2 27.8	2 28.2	2 21.0	51 0.8	111 1.8	171 2.7	51	2 27.8	2 28.2	2 21.0	51 0.8	111 1.8	171 2.7
52	2 13.0	2 13.4	2 06.9	52 0.7	112 1.6	172 2.4	52	2 28.0	2 28.4	2 21.3	52 0.8	112 1.8	172 2.7	52	2 28.0	2 28.4	2 21.3	52 0.8	112 1.8	172 2.7
53	2 13.3	2 13.6	2 07.2	53																

Sec.	SUN PLANET	☿	MOON	code corr'n	code corr'n	code corr'n	Sec.	SUN PLANET	☿	MOON	code corr'n	code corr'n	code corr'n
0	2 30.0	2 30.4	2 23.2	0 0.0	60 1.1	120 2.1	0	2 45.0	2 45.5	2 37.5	0 0.0	60 1.2	120 2.3
1	2 30.3	2 30.7	2 23.4	1 0.0	61 1.1	121 2.1	1	2 45.3	2 45.7	2 37.7	1 0.0	61 1.2	121 2.3
2	2 30.5	2 30.9	2 23.6	2 0.0	62 1.1	122 2.1	2	2 45.5	2 46.0	2 38.0	2 0.0	62 1.2	122 2.3
3	2 30.8	2 31.2	2 23.9	3 0.1	63 1.1	123 2.2	3	2 45.8	2 46.2	2 38.2	3 0.1	63 1.2	123 2.4
4	2 31.0	2 31.4	2 24.1	4 0.1	64 1.1	124 2.2	4	2 46.0	2 46.5	2 38.4	4 0.1	64 1.2	124 2.4
5	2 31.3	2 31.7	2 24.4	5 0.1	65 1.1	125 2.2	5	2 46.3	2 46.7	2 38.7	5 0.1	65 1.2	125 2.4
6	2 31.5	2 31.9	2 24.6	6 0.1	66 1.2	126 2.2	6	2 46.5	2 47.0	2 38.9	6 0.1	66 1.3	126 2.4
7	2 31.8	2 32.2	2 24.8	7 0.1	67 1.2	127 2.2	7	2 46.8	2 47.2	2 39.2	7 0.1	67 1.3	127 2.4
8	2 32.0	2 32.4	2 25.1	8 0.1	68 1.2	128 2.2	8	2 47.0	2 47.5	2 39.4	8 0.2	68 1.3	128 2.5
9	2 32.3	2 32.7	2 25.3	9 0.2	69 1.2	129 2.3	9	2 47.3	2 47.7	2 39.6	9 0.2	69 1.3	129 2.5
10	2 32.5	2 32.9	2 25.6	10 0.2	70 1.2	130 2.3	10	2 47.5	2 48.0	2 39.9	10 0.2	70 1.3	130 2.5
11	2 32.8	2 33.2	2 25.8	11 0.2	71 1.2	131 2.3	11	2 47.8	2 48.2	2 40.1	11 0.2	71 1.4	131 2.5
12	2 33.0	2 33.4	2 26.0	12 0.2	72 1.3	132 2.3	12	2 48.0	2 48.5	2 40.3	12 0.2	72 1.4	132 2.5
13	2 33.3	2 33.7	2 26.3	13 0.2	73 1.3	133 2.3	13	2 48.3	2 48.7	2 40.6	13 0.2	73 1.4	133 2.5
14	2 33.5	2 33.9	2 26.5	14 0.2	74 1.3	134 2.3	14	2 48.5	2 49.0	2 40.8	14 0.3	74 1.4	134 2.6
15	2 33.8	2 34.2	2 26.7	15 0.3	75 1.3	135 2.4	15	2 48.8	2 49.2	2 41.1	15 0.3	75 1.4	135 2.6
16	2 34.0	2 34.4	2 27.0	16 0.3	76 1.3	136 2.4	16	2 49.0	2 49.5	2 41.3	16 0.3	76 1.5	136 2.6
17	2 34.3	2 34.7	2 27.2	17 0.3	77 1.3	137 2.4	17	2 49.3	2 49.7	2 41.5	17 0.3	77 1.5	137 2.6
18	2 34.5	2 34.9	2 27.5	18 0.3	78 1.4	138 2.4	18	2 49.5	2 50.0	2 41.8	18 0.3	78 1.5	138 2.6
19	2 34.8	2 35.2	2 27.7	19 0.3	79 1.4	139 2.4	19	2 49.8	2 50.2	2 42.0	19 0.4	79 1.5	139 2.7
20	2 35.0	2 35.4	2 27.9	20 0.4	80 1.4	140 2.5	20	2 50.0	2 50.5	2 42.3	20 0.4	80 1.5	140 2.7
21	2 35.3	2 35.7	2 28.2	21 0.4	81 1.4	141 2.5	21	2 50.3	2 50.7	2 42.5	21 0.4	81 1.6	141 2.7
22	2 35.5	2 35.9	2 28.4	22 0.4	82 1.4	142 2.5	22	2 50.5	2 51.0	2 42.7	22 0.4	82 1.6	142 2.7
23	2 35.8	2 36.2	2 28.7	23 0.4	83 1.5	143 2.5	23	2 50.8	2 51.2	2 43.0	23 0.4	83 1.6	143 2.7
24	2 36.0	2 36.4	2 28.9	24 0.4	84 1.5	144 2.5	24	2 51.0	2 51.5	2 43.2	24 0.5	84 1.6	144 2.8
25	2 36.3	2 36.7	2 29.1	25 0.4	85 1.5	145 2.5	25	2 51.3	2 51.7	2 43.4	25 0.5	85 1.6	145 2.8
26	2 36.5	2 36.9	2 29.4	26 0.5	86 1.5	146 2.6	26	2 51.5	2 52.0	2 43.7	26 0.5	86 1.6	146 2.8
27	2 36.8	2 37.2	2 29.6	27 0.5	87 1.5	147 2.6	27	2 51.8	2 52.2	2 43.9	27 0.5	87 1.7	147 2.8
28	2 37.0	2 37.4	2 29.8	28 0.5	88 1.5	148 2.6	28	2 52.0	2 52.5	2 44.2	28 0.5	88 1.7	148 2.8
29	2 37.3	2 37.7	2 30.1	29 0.5	89 1.6	149 2.6	29	2 52.3	2 52.7	2 44.4	29 0.6	89 1.7	149 2.9
30	2 37.5	2 37.9	2 30.3	30 0.5	90 1.6	150 2.6	30	2 52.5	2 53.0	2 44.6	30 0.6	90 1.7	150 2.9
31	2 37.8	2 38.2	2 30.6	31 0.5	91 1.6	151 2.6	31	2 52.8	2 53.2	2 44.9	31 0.6	91 1.7	151 2.9
32	2 38.0	2 38.4	2 30.8	32 0.6	92 1.6	152 2.7	32	2 53.0	2 53.5	2 45.1	32 0.6	92 1.8	152 2.9
33	2 38.3	2 38.7	2 31.0	33 0.6	93 1.6	153 2.7	33	2 53.3	2 53.7	2 45.4	33 0.6	93 1.8	153 2.9
34	2 38.5	2 38.9	2 31.3	34 0.6	94 1.6	154 2.7	34	2 53.5	2 54.0	2 45.6	34 0.7	94 1.8	154 3.0
35	2 38.8	2 39.2	2 31.5	35 0.6	95 1.7	155 2.7	35	2 53.8	2 54.2	2 45.8	35 0.7	95 1.8	155 3.0
36	2 39.0	2 39.4	2 31.8	36 0.6	96 1.7	156 2.7	36	2 54.0	2 54.5	2 46.1	36 0.7	96 1.8	156 3.0
37	2 39.3	2 39.7	2 32.0	37 0.6	97 1.7	157 2.7	37	2 54.3	2 54.7	2 46.3	37 0.7	97 1.9	157 3.0
38	2 39.5	2 39.9	2 32.2	38 0.7	98 1.7	158 2.8	38	2 54.5	2 55.0	2 46.6	38 0.7	98 1.9	158 3.0
39	2 39.8	2 40.2	2 32.5	39 0.7	99 1.7	159 2.8	39	2 54.8	2 55.2	2 46.8	39 0.7	99 1.9	159 3.0
40	2 40.0	2 40.4	2 32.7	40 0.7	100 1.8	160 2.8	40	2 55.0	2 55.5	2 47.0	40 0.8	100 1.9	160 3.1
41	2 40.3	2 40.7	2 32.9	41 0.7	101 1.8	161 2.8	41	2 55.3	2 55.7	2 47.3	41 0.8	101 1.9	161 3.1
42	2 40.5	2 40.9	2 33.2	42 0.7	102 1.8	162 2.8	42	2 55.5	2 56.0	2 47.5	42 0.8	102 2.0	162 3.1
43	2 40.8	2 41.2	2 33.4	43 0.8	103 1.8	163 2.9	43	2 55.8	2 56.2	2 47.7	43 0.8	103 2.0	163 3.1
44	2 41.0	2 41.4	2 33.7	44 0.8	104 1.8	164 2.9	44	2 56.0	2 56.5	2 48.0	44 0.8	104 2.0	164 3.1
45	2 41.3	2 41.7	2 33.9	45 0.8	105 1.8	165 2.9	45	2 56.3	2 56.7	2 48.2	45 0.9	105 2.0	165 3.2
46	2 41.5	2 41.9	2 34.1	46 0.8	106 1.9	166 2.9	46	2 56.5	2 57.0	2 48.5	46 0.9	106 2.0	166 3.2
47	2 41.8	2 42.2	2 34.4	47 0.8	107 1.9	167 2.9	47	2 56.8	2 57.2	2 48.7	47 0.9	107 2.1	167 3.2
48	2 42.0	2 42.4	2 34.6	48 0.8	108 1.9	168 2.9	48	2 57.0	2 57.5	2 48.9	48 0.9	108 2.1	168 3.2
49	2 42.3	2 42.7	2 34.9	49 0.9	109 1.9	169 3.0	49	2 57.3	2 57.7	2 49.2	49 0.9	109 2.1	169 3.2
50	2 42.5	2 42.9	2 35.1	50 0.9	110 1.9	170 3.0	50	2 57.5	2 58.0	2 49.4	50 1.0	110 2.1	170 3.3
51	2 42.8	2 43.2	2 35.3	51 0.9	111 1.9	171 3.0	51	2 57.8	2 58.2	2 49.7	51 1.0	111 2.1	171 3.3
52	2 43.0	2 43.4	2 35.6	52 0.9	112 2.0	172 3.0	52	2 58.0	2 58.5	2 49.9	52 1.0	112 2.1	172 3.3
53	2 43.3	2 43.7	2 35.8	53 0.9	113 2.0	173 3.0	53	2 58.3	2 58.7	2 50.1	53 1.0	113 2.2	173 3.3
54	2 43.5	2 43.9	2 36.1	54 0.9	114 2.0	174 3.0	54	2 58.5	2 59.0	2 50.4	54 1.0	114 2.2	174 3.3
55	2 43.8	2 44.2	2 36.3	55 1.0	115 2.0	175 3.1	55	2 58.8	2 59.2	2 50.6	55 1.1	115 2.2	175 3.4
56	2 44.0	2 44.4	2 36.5	56 1.0	116 2.0	176 3.1	56	2 59.0	2 59.5	2 50.8	56 1.1	116 2.2	176 3.4
57	2 44.3	2 44.7	2 36.8	57 1.0	117 2.0	177 3.1	57	2 59.3	2 59.7	2 51.1	57 1.1	117 2.2	177 3.4
58	2 44.5	2 45.0	2 37.0	58 1.0	118 2.1	178 3.1	58	2 59.5	3 00.0	2 51.3	58 1.1	118 2.3	178 3.4
59	2 44.8	2 45.2	2 37.2	59 1.0	119 2.1	179 3.1	59	2 59.8	3 00.2	2 51.6	59 1.1	119 2.3	179 3.4
60	2 45.0	2 45.5	2 37.5	60 1.1	120 2.1	180 3.2	60	3 00.0	3 00.5	2 51.8	60 1.2	120 2.3	180 3.5

Sec.	SUN PLANET	☿	MOON	code corr'n	code corr'n	code corr'n	Sec.	SUN PLANET	☿	MOON	code corr'n	code corr'n	code corr'n
0	3 00.0	3 00.5	2 51.8	0 0.0	60 1.3	120 2.5	0	3 15.0	3 15.5	3 06.1	0 0.0	60 1.4	120 2.7
1	3 00.3	3 00.7	2 52.0	1 0.0	61 1.3	121 2.5	1	3 15.3	3 15.8	3 06.4	1 0.0	61 1.4	121 2.7
2	3 00.5	3 01.0	2 52.3	2 0.0	62 1.3	122 2.5	2	3 15.5	3 16.0	3 06.6	2 0.0	62 1.4	122 2.7
3	3 00.8	3 01.2	2 52.5	3 0.1	63 1.3	123 2.6	3	3 15.8	3 16.3	3 06.8	3 0.1	63 1.4	123 2.8
4	3 01.0	3 01.5	2 52.8	4 0.1	64 1.3	124 2.6	4	3 16.0	3 16.5	3 07.1	4 0.1	64 1.4	124 2.8
5	3 01.3	3 01.7	2 53.0	5 0.1	65 1.4	125 2.6	5	3 16.3	3 16.8	3 07.3	5 0.1	65 1.5	125 2.8
6	3 01.5	3 02.0	2 53.2	6 0.1	66 1.4	126 2.6	6	3 16.5	3 17.0	3 07.5	6 0.1	66 1.5	126 2.8
7	3 01.8	3 02.2	2 53.5	7 0.1	67 1.4	127 2.6	7	3 16.8	3 17.3	3 07.8	7 0.2	67 1.5	127 2.9
8	3 02.0	3 02.5	2 53.7	8 0.2	68 1.4	128 2.7	8	3 17.0	3 17.5	3 08.0	8 0.2	68 1.5	128 2.9
9	3 02.3	3 02.7	2 53.9	9 0.2	69 1.4	129 2.7	9	3 17.3	3 17.8	3 08.3	9 0.2	69 1.6	129 2.9
10	3 02.5	3 03.0	2 54.2	10 0.2	70 1.5	130 2.7	10	3 17.5	3 18.0	3 08.5	10 0.2	70 1.6	130 2.9
11	3 02.8	3 03.3	2 54.4	11 0.2	71 1.5	131 2.7	11	3 17.8	3 18.3	3 08.7	11 0.2	71 1.6	131 2.9
12	3 03.0	3 03.5	2 54.7	12 0.3	72 1.5	132 2.8	12	3 18.0	3 18.5	3 09.0	12 0.3	72 1.6	132 3.0
13	3 03.3	3 03.8	2 54.9	13 0.3	73 1.5	133 2.8	13	3 18.3	3 18.8	3 09.2	13 0.3	73 1.6	133 3.0
14	3 03.5	3 04.0	2 55.1	14 0.3	74 1.5	134 2.8	14	3 18.5	3 19.0	3 09.5	14 0.3	74 1.7	134 3.0
15	3 03.8	3 04.3	2 55.4	15 0.3	75 1.6	135 2.8	15	3 18.8	3 19.3	3 09.7	15 0.3	75 1.7	135 3.0
16	3 04.0	3 04.5	2 55.6	16 0.3	76 1.6	136 2.8	16	3 19.0	3 19.5	3 09.9	16 0.4	76 1.7	136 3.1
17	3 04.3	3 04.8	2 55.9	17 0.4	77 1.6	137 2.9	17	3 19.3	3 19.8	3 10.2	17 0.4	77 1.7	137 3.1
18	3 04.5	3 05.0	2 56.1	18 0.4	78 1.6	138 2.9	18	3 19.5	3 20.0	3 10.4	18 0.4	78 1.8	138 3.1
19	3 04.8	3 05.3	2 56.3	19 0.4	79 1.6	139 2.9	19	3 19.8	3 20.3	3 10.7	19 0.4	79 1.8	139 3.1
20	3 05.0	3 05.5	2 56.6	20 0.4	80 1.7	140 2.9	20	3 20.0	3 20.5	3 10.9	20 0.5	80 1.8	140 3.2
21	3 05.3	3 05.8	2 56.8	21 0.4	81 1.7	141 2.9	21	3 20.3	3 20.8	3 11.1	21 0.5	81 1.8	141 3.2
22	3 05.5	3 06.0	2 57.0	22 0.5	82 1.7	142 3.0	22	3 20.5	3 21.0	3 11.4	22 0.5	82 1.8	142 3.2
23	3 05.8	3 06.3	2 57.3	23 0.5	83 1.7	143 3.0	23	3 20.8	3 21.3	3 11.6	23 0.5	83 1.9	143 3.2
24	3 06.0	3 06.5	2 57.5	24 0.5	84 1.8	144 3.0	24	3 21.0	3 21.6	3 11.8	24 0.5	84 1.9	144 3.2
25	3 06.3	3 06.8	2 57.8	25 0.5	85 1.8	145 3.0	25	3 21.3	3 21.8	3 12.1	25 0.6	85 1.9	145 3.3
26	3 06.5	3 07.0	2 58.0	26 0.5	86 1.8	146 3.0	26	3 21.5	3 22.1	3 12.3	26 0.6	86 1.9	146 3.3
27	3 06.8	3 07.3	2 58.2	27 0.6	87 1.8	147 3.1	27	3 21.8	3 22.3	3 12.6	27 0.6	87 2.0	147 3.3
28	3 07.0	3 07.5	2 58.5	28 0.6	88 1.8	148 3.1	28	3 22.0	3 22.6	3 12.8	28 0.6	88 2.0	148 3.3
29	3 07.3	3 07.8	2 58.7	29 0.6	89 1.9	149 3.1	29	3 22.3	3 22.8	3 13.0	29 0.7	89 2.0	149 3.4
30	3 07.5	3 08.0	2 59.0	30 0.6	90 1.9	150 3.1	30	3 22.5	3 23.1	3 13.3	30 0.7	90 2.0	150 3.4
31	3 07.8	3 08.3	2 59.2	31 0.6	91 1.9	151 3.1	31	3 22.8	3 23.3	3 13.5	31 0.7	91 2.0	151 3.4
32	3 08.0	3 08.5	2 59.4	32 0.7	92 1.9	152 3.2	32	3 23.0	3 23.6	3 13.8	32 0.7	92 2.1	152 3.4
33	3 08.3	3 08.8	2 59.7	33 0.7	93 1.9	153 3.2	33	3 23.3	3 23.8	3 14.0	33 0.7	93 2.1	153 3.4
34	3 08.5	3 09.0	2 59.9	34 0.7	94 2.0	154 3.2	34	3 23.5	3 24.1	3 14.2	34 0.8	94 2.1	154 3.5
35	3 08.8	3 09.3	3 00.2	35 0.7	95 2.0	155 3.2	35	3 23.8	3 24.3	3 14.5	35 0.8	95 2.1	155 3.5
36	3 09.0	3 09.5	3 00.4	36 0.8	96 2.0	156 3.3	36	3 24.0	3 24.6	3 14.7	36 0.8	96 2.2	156 3.5
37	3 09.3	3 09.8	3 00.6	37 0.8	97 2.0	157 3.3	37	3 24.3	3 24.8	3 14.9	37 0.8	97 2.2	157 3.5
38	3 09.5	3 10.0	3 00.9	38 0.8	98 2.0	158 3.3	38	3 24.5	3 25.1	3 15.2	38 0.9	98 2.2	158 3.6
39	3 09.8	3 10.3	3 01.1	39 0.8	99 2.1	159 3.3	39	3 24.8	3 25.3	3 15.4	39 0.9	99 2.2	159 3.6
40	3 10.0	3 10.5	3 01.3	40 0.8	100 2.1	160 3.3	40	3 25.0	3 25.6	3 15.7	40 0.9	100 2.3	160 3.6
41	3 10.3	3 10.8	3 01.6	41 0.9	101 2.1	161 3.4	41	3 25.3	3 25.8	3 15.9	41 0.9	101 2.3	161 3.6
42	3 10.5	3 11.0	3 01.8	42 0.9	102 2.1	162 3.4	42	3 25.5	3 26.1	3 16.1	42 0.9	102 2.3	162 3.6
43	3 10.8	3 11.3	3 02.1	43 0.9	103 2.1	163 3.4	43	3 25.8	3 26.3	3 16.4	43 1.0	103 2.3	163 3.7
44	3 11.0	3 11.5	3 02.3	44 0.9	104 2.2	164 3.4	44	3 26.0	3 26.6	3 16.6	44 1.0	104 2.3	164 3.7
45	3 11.3	3 11.8	3 02.5	45 0.9	105 2.2	165 3.4	45	3 26.3	3 26.8	3 16.9	45 1.0	105 2.4	165 3.7
46	3 11.5	3 12.0	3 02.8	46 1.0	106 2.2	166 3.5	46	3 26.5	3 27.1	3 17.1	46 1.0	106 2.4	166 3.7
47	3 11.8	3 12.3	3 03.0	47 1.0	107 2.2	167 3.5	47	3 26.8	3 27.3	3 17.3	47 1.1	107 2.4	167 3.8
48	3 12.0	3 12.5	3 03.3	48 1.0	108 2.3	168 3.5	48	3 27.0	3 27.6	3 17.6	48 1.1	108 2.4	168 3.8
49	3 12.3	3 12.8	3 03.5	49 1.0	109 2.3	169 3.5	49	3 27.3	3 27.8	3 17.8	49 1.1	109 2.5	169 3.8
50	3 12.5	3 13.0	3 03.7	50 1.0	110 2.3	170 3.5	50	3 27.5	3 28.1	3 18.0	50 1.1	110 2.5	170 3.8
51	3 12.8	3 13.3	3 04.0	51 1.1	111 2.3	171 3.6	51	3 27.8	3 28.3	3 18.3	51 1.1	111 2.5	171 3.8
52	3 13.0	3 13.5	3 04.2	52 1.1	112 2.3	172 3.6	52	3 28.0	3 28.6	3 18.5	52 1.2	112 2.5	172 3.9
53	3 13.3	3 13.8	3 04.4	53 1.1	113 2.4	173 3.6	53	3 28.3	3 28.8	3 18.8	53 1.2	113 2.5	173 3.9
54	3 13.5	3 14.0	3 04.7	54 1.1	114 2.4	174 3.6	54	3 28.5	3 29.1	3 19.0	54 1.2	114 2.6	174 3.9
55	3 13.8	3 14.3	3 04.9	55 1.1	115 2.4	175 3.6	55	3 28.8	3 29.3	3 19.2	55 1.2	115 2.6	175 3.9
56	3 14.0	3 14.5	3 05.2	56 1.2	116 2.4	176 3.7	56	3 29.0	3 29.6	3 19.5	56 1.3	116 2.6	176 4.0
57	3 14.3	3 14.8	3 05.4	57 1.2	117 2.4	177 3.7	57	3 29.3	3 29.8	3 19.7	57 1.3	117 2.6	177 4.0
58	3 14.5	3 15.0	3 05.6	58 1.2	118 2.5	178 3.7	58	3 29.5	3 30.1	3 20.0	58 1.3	118 2.7	178 4.0
59	3 14.8	3 15.3	3 05.9	59 1.2	119 2.5	179 3.7	59	3 29.8	3 30.3	3 20.2	59 1.3	119 2.7	179 4.0
60	3 15.0	3 15.5	3 06.1	60 1.3	120 2.5	180 3.8	60	3 30.0	3 30.6	3 20.4	60 1.4	120 2.7	180 4.1

Sec.	SUN PLANET	☿	MOON	code	corr'n	code	corr'n	code	corr'n	Sec.	SUN PLANET	☿	MOON	code	corr'n	code	corr'n	code	corr'n
0	3 30.0	3 30.6	3 20.4	0	0.0	60	1.5	120	2.9	0	3 45.0	3 45.6	3 34.8	0	0.0	60	1.6	120	3.1
1	3 30.3	3 30.8	3 20.7	1	0.0	61	1.5	121	2.9	1	3 45.3	3 45.9	3 35.0	1	0.0	61	1.6	121	3.1
2	3 30.5	3 31.1	3 20.9	2	0.0	62	1.5	122	2.9	2	3 45.5	3 46.1	3 35.2	2	0.1	62	1.6	122	3.2
3	3 30.8	3 31.3	3 21.1	3	0.1	63	1.5	123	3.0	3	3 45.8	3 46.4	3 35.5	3	0.1	63	1.6	123	3.2
4	3 31.0	3 31.6	3 21.4	4	0.1	64	1.5	124	3.0	4	3 46.0	3 46.6	3 35.7	4	0.1	64	1.7	124	3.2
5	3 31.3	3 31.8	3 21.6	5	0.1	65	1.6	125	3.0	5	3 46.3	3 46.9	3 35.9	5	0.1	65	1.7	125	3.2
6	3 31.5	3 32.1	3 21.9	6	0.1	66	1.6	126	3.0	6	3 46.5	3 47.1	3 36.2	6	0.2	66	1.7	126	3.3
7	3 31.8	3 32.3	3 22.1	7	0.2	67	1.6	127	3.1	7	3 46.8	3 47.4	3 36.4	7	0.2	67	1.7	127	3.3
8	3 32.0	3 32.6	3 22.3	8	0.2	68	1.6	128	3.1	8	3 47.0	3 47.6	3 36.7	8	0.2	68	1.8	128	3.3
9	3 32.3	3 32.8	3 22.6	9	0.2	69	1.7	129	3.1	9	3 47.3	3 47.9	3 36.9	9	0.2	69	1.8	129	3.3
10	3 32.5	3 33.1	3 22.8	10	0.2	70	1.7	130	3.1	10	3 47.5	3 48.1	3 37.1	10	0.3	70	1.8	130	3.4
11	3 32.8	3 33.3	3 23.1	11	0.3	71	1.7	131	3.2	11	3 47.8	3 48.4	3 37.4	11	0.3	71	1.8	131	3.4
12	3 33.0	3 33.6	3 23.3	12	0.3	72	1.7	132	3.2	12	3 48.0	3 48.6	3 37.6	12	0.3	72	1.9	132	3.4
13	3 33.3	3 33.8	3 23.5	13	0.3	73	1.8	133	3.2	13	3 48.3	3 48.9	3 37.9	13	0.3	73	1.9	133	3.4
14	3 33.5	3 34.1	3 23.8	14	0.3	74	1.8	134	3.2	14	3 48.5	3 49.1	3 38.1	14	0.4	74	1.9	134	3.5
15	3 33.8	3 34.3	3 24.0	15	0.4	75	1.8	135	3.3	15	3 48.8	3 49.4	3 38.3	15	0.4	75	1.9	135	3.5
16	3 34.0	3 34.6	3 24.3	16	0.4	76	1.8	136	3.3	16	3 49.0	3 49.6	3 38.6	16	0.4	76	2.0	136	3.5
17	3 34.3	3 34.8	3 24.5	17	0.4	77	1.9	137	3.3	17	3 49.3	3 49.9	3 38.8	17	0.4	77	2.0	137	3.5
18	3 34.5	3 35.1	3 24.7	18	0.4	78	1.9	138	3.3	18	3 49.5	3 50.1	3 39.0	18	0.5	78	2.0	138	3.6
19	3 34.8	3 35.3	3 25.0	19	0.5	79	1.9	139	3.4	19	3 49.8	3 50.4	3 39.3	19	0.5	79	2.0	139	3.6
20	3 35.0	3 35.6	3 25.2	20	0.5	80	1.9	140	3.4	20	3 50.0	3 50.6	3 39.5	20	0.5	80	2.1	140	3.6
21	3 35.3	3 35.8	3 25.4	21	0.5	81	2.0	141	3.4	21	3 50.3	3 50.9	3 39.8	21	0.5	81	2.1	141	3.6
22	3 35.5	3 36.1	3 25.7	22	0.5	82	2.0	142	3.4	22	3 50.5	3 51.1	3 40.0	22	0.6	82	2.1	142	3.7
23	3 35.8	3 36.3	3 25.9	23	0.6	83	2.0	143	3.5	23	3 50.8	3 51.4	3 40.2	23	0.6	83	2.1	143	3.7
24	3 36.0	3 36.6	3 26.2	24	0.6	84	2.0	144	3.5	24	3 51.0	3 51.6	3 40.5	24	0.6	84	2.2	144	3.7
25	3 36.3	3 36.8	3 26.4	25	0.6	85	2.1	145	3.5	25	3 51.3	3 51.9	3 40.7	25	0.6	85	2.2	145	3.7
26	3 36.5	3 37.1	3 26.6	26	0.6	86	2.1	146	3.5	26	3 51.5	3 52.1	3 41.0	26	0.7	86	2.2	146	3.8
27	3 36.8	3 37.3	3 26.9	27	0.7	87	2.1	147	3.6	27	3 51.8	3 52.4	3 41.2	27	0.7	87	2.2	147	3.8
28	3 37.0	3 37.6	3 27.1	28	0.7	88	2.1	148	3.6	28	3 52.0	3 52.6	3 41.4	28	0.7	88	2.3	148	3.8
29	3 37.3	3 37.8	3 27.4	29	0.7	89	2.2	149	3.6	29	3 52.3	3 52.9	3 41.7	29	0.7	89	2.3	149	3.8
30	3 37.5	3 38.1	3 27.6	30	0.7	90	2.2	150	3.6	30	3 52.5	3 53.1	3 41.9	30	0.8	90	2.3	150	3.9
31	3 37.8	3 38.3	3 27.8	31	0.7	91	2.2	151	3.6	31	3 52.8	3 53.4	3 42.1	31	0.8	91	2.4	151	3.9
32	3 38.0	3 38.6	3 28.1	32	0.8	92	2.2	152	3.7	32	3 53.0	3 53.6	3 42.4	32	0.8	92	2.4	152	3.9
33	3 38.3	3 38.8	3 28.3	33	0.8	93	2.2	153	3.7	33	3 53.3	3 53.9	3 42.6	33	0.9	93	2.4	153	4.0
34	3 38.5	3 39.1	3 28.5	34	0.8	94	2.3	154	3.7	34	3 53.5	3 54.1	3 42.9	34	0.9	94	2.4	154	4.0
35	3 38.8	3 39.3	3 28.8	35	0.8	95	2.3	155	3.7	35	3 53.8	3 54.4	3 43.1	35	0.9	95	2.5	155	4.0
36	3 39.0	3 39.6	3 29.0	36	0.9	96	2.3	156	3.8	36	3 54.0	3 54.6	3 43.3	36	0.9	96	2.5	156	4.0
37	3 39.3	3 39.9	3 29.3	37	0.9	97	2.3	157	3.8	37	3 54.3	3 54.9	3 43.6	37	1.0	97	2.5	157	4.1
38	3 39.5	3 40.1	3 29.5	38	0.9	98	2.4	158	3.8	38	3 54.5	3 55.1	3 43.8	38	1.0	98	2.5	158	4.1
39	3 39.8	3 40.4	3 29.7	39	0.9	99	2.4	159	3.8	39	3 54.8	3 55.4	3 44.1	39	1.0	99	2.6	159	4.1
40	3 40.0	3 40.6	3 30.0	40	1.0	100	2.4	160	3.9	40	3 55.0	3 55.6	3 44.3	40	1.0	100	2.6	160	4.1
41	3 40.3	3 40.9	3 30.2	41	1.0	101	2.4	161	3.9	41	3 55.3	3 55.9	3 44.5	41	1.1	101	2.6	161	4.2
42	3 40.5	3 41.1	3 30.5	42	1.0	102	2.5	162	3.9	42	3 55.5	3 56.1	3 44.8	42	1.1	102	2.6	162	4.2
43	3 40.8	3 41.4	3 30.7	43	1.0	103	2.5	163	3.9	43	3 55.8	3 56.4	3 45.0	43	1.1	103	2.7	163	4.2
44	3 41.0	3 41.6	3 30.9	44	1.1	104	2.5	164	4.0	44	3 56.0	3 56.6	3 45.2	44	1.1	104	2.7	164	4.2
45	3 41.3	3 41.9	3 31.2	45	1.1	105	2.5	165	4.0	45	3 56.3	3 56.9	3 45.5	45	1.2	105	2.7	165	4.3
46	3 41.5	3 42.1	3 31.4	46	1.1	106	2.6	166	4.0	46	3 56.5	3 57.1	3 45.7	46	1.2	106	2.7	166	4.3
47	3 41.8	3 42.4	3 31.6	47	1.1	107	2.6	167	4.0	47	3 56.8	3 57.4	3 46.0	47	1.2	107	2.8	167	4.3
48	3 42.0	3 42.6	3 31.9	48	1.2	108	2.6	168	4.1	48	3 57.0	3 57.6	3 46.2	48	1.2	108	2.8	168	4.3
49	3 42.3	3 42.9	3 32.1	49	1.2	109	2.6	169	4.1	49	3 57.3	3 57.9	3 46.4	49	1.3	109	2.8	169	4.4
50	3 42.5	3 43.1	3 32.4	50	1.2	110	2.7	170	4.1	50	3 57.5	3 58.2	3 46.7	50	1.3	110	2.8	170	4.4
51	3 42.8	3 43.4	3 32.6	51	1.2	111	2.7	171	4.1	51	3 57.8	3 58.4	3 46.9	51	1.3	111	2.9	171	4.4
52	3 43.0	3 43.6	3 32.8	52	1.3	112	2.7	172	4.2	52	3 58.0	3 58.7	3 47.2	52	1.3	112	2.9	172	4.4
53	3 43.3	3 43.9	3 33.1	53	1.3	113	2.7	173	4.2	53	3 58.3	3 58.9	3 47.4	53	1.4	113	2.9	173	4.5
54	3 43.5	3 44.1	3 33.3	54	1.3	114	2.8	174	4.2	54	3 58.5	3 59.2	3 47.6	54	1.4	114	2.9	174	4.5
55	3 43.8	3 44.4	3 33.6	55	1.3	115	2.8	175	4.2	55	3 58.8	3 59.4	3 47.9	55	1.4	115	3.0	175	4.5
56	3 44.0	3 44.6	3 33.8	56	1.4	116	2.8	176	4.3	56	3 59.0	3 59.7	3 48.1	56	1.4	116	3.0	176	4.5
57	3 44.3	3 44.9	3 34.0	57	1.4	117	2.8	177	4.3	57	3 59.3	3 59.9	3 48.4	57	1.5	117	3.0	177	4.6
58	3 44.5	3 45.1	3 34.3	58	1.4	118	2.9	178	4.3	58	3 59.5	4 00.2	3 48.6	58	1.5	118	3.0	178	4.6
59	3 44.8	3 45.4	3 34.5	59	1.4	119	2.9	179	4.3	59	3 59.8	4 00.4	3 48.8	59	1.5	119	3.1	179	4.6
60	3 45.0	3 45.6	3 34.8	60	1.5	120	2.9	180	4.4	60	4 00.0	4 00.7	3 49.1	60	1.6	120	3.1	180	4.7

Sec.	SUN PLANET	☿	MOON	code corr'n	code corr'n	code corr'n	Sec.	SUN PLANET	☿	MOON	code corr'n	code corr'n	code corr'n
0	4 00.0	4 00.7	3 49.1	0 0.0	60 1.7	120 3.3	0	4 15.0	4 15.7	4 03.4	0 0.0	60 1.8	120 3.5
1	4 00.3	4 00.9	3 49.3	1 0.0	61 1.7	121 3.3	1	4 15.3	4 15.9	4 03.6	1 0.0	61 1.8	121 3.5
2	4 00.5	4 01.2	3 49.5	2 0.1	62 1.7	122 3.4	2	4 15.5	4 16.2	4 03.9	2 0.1	62 1.8	122 3.6
3	4 00.8	4 01.4	3 49.8	3 0.1	63 1.7	123 3.4	3	4 15.8	4 16.5	4 04.1	3 0.1	63 1.8	123 3.6
4	4 01.0	4 01.7	3 50.0	4 0.1	64 1.8	124 3.4	4	4 16.0	4 16.7	4 04.3	4 0.1	64 1.9	124 3.6
5	4 01.3	4 01.9	3 50.3	5 0.1	65 1.8	125 3.4	5	4 16.3	4 17.0	4 04.6	5 0.1	65 1.9	125 3.6
6	4 01.5	4 02.2	3 50.5	6 0.2	66 1.8	126 3.5	6	4 16.5	4 17.2	4 04.8	6 0.2	66 1.9	126 3.7
7	4 01.8	4 02.4	3 50.7	7 0.2	67 1.8	127 3.5	7	4 16.8	4 17.5	4 05.1	7 0.2	67 2.0	127 3.7
8	4 02.0	4 02.7	3 51.0	8 0.2	68 1.9	128 3.5	8	4 17.0	4 17.7	4 05.3	8 0.2	68 2.0	128 3.7
9	4 02.3	4 02.9	3 51.2	9 0.2	69 1.9	129 3.5	9	4 17.3	4 18.0	4 05.5	9 0.3	69 2.0	129 3.8
10	4 02.5	4 03.2	3 51.5	10 0.3	70 1.9	130 3.6	10	4 17.5	4 18.2	4 05.8	10 0.3	70 2.0	130 3.8
11	4 02.8	4 03.4	3 51.7	11 0.3	71 2.0	131 3.6	11	4 17.8	4 18.5	4 06.0	11 0.3	71 2.1	131 3.8
12	4 03.0	4 03.7	3 51.9	12 0.3	72 2.0	132 3.6	12	4 18.0	4 18.7	4 06.2	12 0.4	72 2.1	132 3.9
13	4 03.3	4 03.9	3 52.2	13 0.4	73 2.0	133 3.7	13	4 18.3	4 19.0	4 06.5	13 0.4	73 2.1	133 3.9
14	4 03.5	4 04.2	3 52.4	14 0.4	74 2.0	134 3.7	14	4 18.5	4 19.2	4 06.7	14 0.4	74 2.2	134 3.9
15	4 03.8	4 04.4	3 52.6	15 0.4	75 2.1	135 3.7	15	4 18.8	4 19.5	4 07.0	15 0.4	75 2.2	135 3.9
16	4 04.0	4 04.7	3 52.9	16 0.4	76 2.1	136 3.7	16	4 19.0	4 19.7	4 07.2	16 0.5	76 2.2	136 4.0
17	4 04.3	4 04.9	3 53.1	17 0.5	77 2.1	137 3.8	17	4 19.3	4 20.0	4 07.4	17 0.5	77 2.2	137 4.0
18	4 04.5	4 05.2	3 53.4	18 0.5	78 2.1	138 3.8	18	4 19.5	4 20.2	4 07.7	18 0.5	78 2.3	138 4.0
19	4 04.8	4 05.4	3 53.6	19 0.5	79 2.2	139 3.8	19	4 19.8	4 20.5	4 07.9	19 0.6	79 2.3	139 4.1
20	4 05.0	4 05.7	3 53.8	20 0.6	80 2.2	140 3.9	20	4 20.0	4 20.7	4 08.2	20 0.6	80 2.3	140 4.1
21	4 05.3	4 05.9	3 54.1	21 0.6	81 2.2	141 3.9	21	4 20.3	4 21.0	4 08.4	21 0.6	81 2.4	141 4.1
22	4 05.5	4 06.2	3 54.3	22 0.6	82 2.3	142 3.9	22	4 20.5	4 21.2	4 08.6	22 0.6	82 2.4	142 4.1
23	4 05.8	4 06.4	3 54.6	23 0.6	83 2.3	143 3.9	23	4 20.8	4 21.5	4 08.9	23 0.7	83 2.4	143 4.2
24	4 06.0	4 06.7	3 54.8	24 0.7	84 2.3	144 4.0	24	4 21.0	4 21.7	4 09.1	24 0.7	84 2.5	144 4.2
25	4 06.3	4 06.9	3 55.0	25 0.7	85 2.3	145 4.0	25	4 21.3	4 22.0	4 09.3	25 0.7	85 2.5	145 4.2
26	4 06.5	4 07.2	3 55.3	26 0.7	86 2.4	146 4.0	26	4 21.5	4 22.2	4 09.6	26 0.8	86 2.5	146 4.3
27	4 06.8	4 07.4	3 55.5	27 0.7	87 2.4	147 4.0	27	4 21.8	4 22.5	4 09.8	27 0.8	87 2.5	147 4.3
28	4 07.0	4 07.7	3 55.7	28 0.8	88 2.4	148 4.1	28	4 22.0	4 22.7	4 10.1	28 0.8	88 2.6	148 4.3
29	4 07.3	4 07.9	3 56.0	29 0.8	89 2.4	149 4.1	29	4 22.3	4 23.0	4 10.3	29 0.8	89 2.6	149 4.3
30	4 07.5	4 08.2	3 56.2	30 0.8	90 2.5	150 4.1	30	4 22.5	4 23.2	4 10.5	30 0.9	90 2.6	150 4.4
31	4 07.8	4 08.4	3 56.5	31 0.9	91 2.5	151 4.2	31	4 22.8	4 23.5	4 10.8	31 0.9	91 2.7	151 4.4
32	4 08.0	4 08.7	3 56.7	32 0.9	92 2.5	152 4.2	32	4 23.0	4 23.7	4 11.0	32 0.9	92 2.7	152 4.4
33	4 08.3	4 08.9	3 56.9	33 0.9	93 2.6	153 4.2	33	4 23.3	4 24.0	4 11.3	33 1.0	93 2.7	153 4.5
34	4 08.5	4 09.2	3 57.2	34 0.9	94 2.6	154 4.2	34	4 23.5	4 24.2	4 11.5	34 1.0	94 2.7	154 4.5
35	4 08.8	4 09.4	3 57.4	35 1.0	95 2.6	155 4.3	35	4 23.8	4 24.5	4 11.7	35 1.0	95 2.8	155 4.5
36	4 09.0	4 09.7	3 57.7	36 1.0	96 2.6	156 4.3	36	4 24.0	4 24.7	4 12.0	36 1.1	96 2.8	156 4.6
37	4 09.3	4 09.9	3 57.9	37 1.0	97 2.7	157 4.3	37	4 24.3	4 25.0	4 12.2	37 1.1	97 2.8	157 4.6
38	4 09.5	4 10.2	3 58.1	38 1.0	98 2.7	158 4.3	38	4 24.5	4 25.2	4 12.5	38 1.1	98 2.9	158 4.6
39	4 09.8	4 10.4	3 58.4	39 1.1	99 2.7	159 4.4	39	4 24.8	4 25.5	4 12.7	39 1.1	99 2.9	159 4.6
40	4 10.0	4 10.7	3 58.6	40 1.1	100 2.8	160 4.4	40	4 25.0	4 25.7	4 12.9	40 1.2	100 2.9	160 4.7
41	4 10.3	4 10.9	3 58.8	41 1.1	101 2.8	161 4.4	41	4 25.3	4 26.0	4 13.2	41 1.2	101 2.9	161 4.7
42	4 10.5	4 11.2	3 59.1	42 1.2	102 2.8	162 4.5	42	4 25.5	4 26.2	4 13.4	42 1.2	102 3.0	162 4.7
43	4 10.8	4 11.4	3 59.3	43 1.2	103 2.8	163 4.5	43	4 25.8	4 26.5	4 13.6	43 1.3	103 3.0	163 4.8
44	4 11.0	4 11.7	3 59.6	44 1.2	104 2.9	164 4.5	44	4 26.0	4 26.7	4 13.9	44 1.3	104 3.0	164 4.8
45	4 11.3	4 11.9	3 59.8	45 1.2	105 2.9	165 4.5	45	4 26.3	4 27.0	4 14.1	45 1.3	105 3.1	165 4.8
46	4 11.5	4 12.2	4 00.0	46 1.3	106 2.9	166 4.6	46	4 26.5	4 27.2	4 14.4	46 1.3	106 3.1	166 4.8
47	4 11.8	4 12.4	4 00.3	47 1.3	107 2.9	167 4.6	47	4 26.8	4 27.5	4 14.6	47 1.4	107 3.1	167 4.9
48	4 12.0	4 12.7	4 00.5	48 1.3	108 3.0	168 4.6	48	4 27.0	4 27.7	4 14.8	48 1.4	108 3.2	168 4.9
49	4 12.3	4 12.9	4 00.8	49 1.3	109 3.0	169 4.6	49	4 27.3	4 28.0	4 15.1	49 1.4	109 3.2	169 4.9
50	4 12.5	4 13.2	4 01.0	50 1.4	110 3.0	170 4.7	50	4 27.5	4 28.2	4 15.3	50 1.5	110 3.2	170 5.0
51	4 12.8	4 13.4	4 01.2	51 1.4	111 3.1	171 4.7	51	4 27.8	4 28.5	4 15.6	51 1.5	111 3.2	171 5.0
52	4 13.0	4 13.7	4 01.5	52 1.4	112 3.1	172 4.7	52	4 28.0	4 28.7	4 15.8	52 1.5	112 3.3	172 5.0
53	4 13.3	4 13.9	4 01.7	53 1.5	113 3.1	173 4.8	53	4 28.3	4 29.0	4 16.0	53 1.5	113 3.3	173 5.0
54	4 13.5	4 14.2	4 02.0	54 1.5	114 3.1	174 4.8	54	4 28.5	4 29.2	4 16.3	54 1.6	114 3.3	174 5.1
55	4 13.8	4 14.4	4 02.2	55 1.5	115 3.2	175 4.8	55	4 28.8	4 29.5	4 16.5	55 1.6	115 3.4	175 5.1
56	4 14.0	4 14.7	4 02.4	56 1.5	116 3.2	176 4.8	56	4 29.0	4 29.7	4 16.7	56 1.6	116 3.4	176 5.1
57	4 14.3	4 14.9	4 02.7	57 1.6	117 3.2	177 4.9	57	4 29.3	4 30.0	4 17.0	57 1.7	117 3.4	177 5.2
58	4 14.5	4 15.2	4 02.9	58 1.6	118 3.2	178 4.9	58	4 29.5	4 30.2	4 17.2	58 1.7	118 3.4	178 5.2
59	4 14.8	4 15.4	4 03.1	59 1.6	119 3.3	179 4.9	59	4 29.8	4 30.5	4 17.5	59 1.7	119 3.5	179 5.2
60	4 15.0	4 15.7	4 03.4	60 1.7	120 3.3	180 5.0	60	4 30.0	4 30.7	4 17.7	60 1.8	120 3.5	180 5.3

Sec.	SUN PLANET	☿	MOON	code corr'n	code corr'n	code corr'n	Sec.	SUN PLANET	☿	MOON	code corr'n	code corr'n	code corr'n
0	4 30.0	4 30.7	4 17.7	0 0.0	60 1.9	120 3.7	0	4 45.0	4 45.8	4 32.0	0 0.0	60 2.0	120 3.9
1	4 30.3	4 31.0	4 17.9	1 0.0	61 1.9	121 3.7	1	4 45.3	4 46.0	4 32.3	1 0.0	61 2.0	121 3.9
2	4 30.5	4 31.2	4 18.2	2 0.1	62 1.9	122 3.8	2	4 45.5	4 46.3	4 32.5	2 0.1	62 2.0	122 4.0
3	4 30.8	4 31.5	4 18.4	3 0.1	63 1.9	123 3.8	3	4 45.8	4 46.5	4 32.7	3 0.1	63 2.0	123 4.0
4	4 31.0	4 31.7	4 18.7	4 0.1	64 2.0	124 3.8	4	4 46.0	4 46.8	4 33.0	4 0.1	64 2.1	124 4.0
5	4 31.3	4 32.0	4 18.9	5 0.2	65 2.0	125 3.9	5	4 46.3	4 47.0	4 33.2	5 0.2	65 2.1	125 4.1
6	4 31.5	4 32.2	4 19.1	6 0.2	66 2.0	126 3.9	6	4 46.5	4 47.3	4 33.4	6 0.2	66 2.1	126 4.1
7	4 31.8	4 32.5	4 19.4	7 0.2	67 2.1	127 3.9	7	4 46.8	4 47.5	4 33.7	7 0.2	67 2.2	127 4.1
8	4 32.0	4 32.7	4 19.6	8 0.2	68 2.1	128 3.9	8	4 47.0	4 47.8	4 33.9	8 0.3	68 2.2	128 4.2
9	4 32.3	4 33.0	4 19.8	9 0.3	69 2.1	129 4.0	9	4 47.3	4 48.0	4 34.2	9 0.3	69 2.2	129 4.2
10	4 32.5	4 33.2	4 20.1	10 0.3	70 2.2	130 4.0	10	4 47.5	4 48.3	4 34.4	10 0.3	70 2.3	130 4.2
11	4 32.8	4 33.5	4 20.3	11 0.3	71 2.2	131 4.0	11	4 47.8	4 48.5	4 34.6	11 0.4	71 2.3	131 4.3
12	4 33.0	4 33.7	4 20.6	12 0.4	72 2.2	132 4.1	12	4 48.0	4 48.8	4 34.9	12 0.4	72 2.3	132 4.3
13	4 33.3	4 34.0	4 20.8	13 0.4	73 2.3	133 4.1	13	4 48.3	4 49.0	4 35.1	13 0.4	73 2.4	133 4.3
14	4 33.5	4 34.2	4 21.0	14 0.4	74 2.3	134 4.1	14	4 48.5	4 49.3	4 35.4	14 0.5	74 2.4	134 4.4
15	4 33.8	4 34.5	4 21.3	15 0.5	75 2.3	135 4.2	15	4 48.8	4 49.5	4 35.6	15 0.5	75 2.4	135 4.4
16	4 34.0	4 34.8	4 21.5	16 0.5	76 2.3	136 4.2	16	4 49.0	4 49.8	4 35.8	16 0.5	76 2.5	136 4.4
17	4 34.3	4 35.0	4 21.8	17 0.5	77 2.4	137 4.2	17	4 49.3	4 50.0	4 36.1	17 0.6	77 2.5	137 4.5
18	4 34.5	4 35.3	4 22.0	18 0.6	78 2.4	138 4.3	18	4 49.5	4 50.3	4 36.3	18 0.6	78 2.5	138 4.5
19	4 34.8	4 35.5	4 22.2	19 0.6	79 2.4	139 4.3	19	4 49.8	4 50.5	4 36.6	19 0.6	79 2.6	139 4.5
20	4 35.0	4 35.8	4 22.5	20 0.6	80 2.5	140 4.3	20	4 50.0	4 50.8	4 36.8	20 0.7	80 2.6	140 4.6
21	4 35.3	4 36.0	4 22.7	21 0.6	81 2.5	141 4.3	21	4 50.3	4 51.0	4 37.0	21 0.7	81 2.6	141 4.6
22	4 35.5	4 36.3	4 22.9	22 0.7	82 2.5	142 4.4	22	4 50.5	4 51.3	4 37.3	22 0.7	82 2.7	142 4.6
23	4 35.8	4 36.5	4 23.2	23 0.7	83 2.6	143 4.4	23	4 50.8	4 51.5	4 37.5	23 0.7	83 2.7	143 4.6
24	4 36.0	4 36.8	4 23.4	24 0.7	84 2.6	144 4.4	24	4 51.0	4 51.8	4 37.7	24 0.8	84 2.7	144 4.7
25	4 36.3	4 37.0	4 23.7	25 0.8	85 2.6	145 4.5	25	4 51.3	4 52.0	4 38.0	25 0.8	85 2.8	145 4.7
26	4 36.5	4 37.3	4 23.9	26 0.8	86 2.7	146 4.5	26	4 51.5	4 52.3	4 38.2	26 0.8	86 2.8	146 4.7
27	4 36.8	4 37.5	4 24.1	27 0.8	87 2.7	147 4.5	27	4 51.8	4 52.5	4 38.5	27 0.9	87 2.8	147 4.8
28	4 37.0	4 37.8	4 24.4	28 0.9	88 2.7	148 4.6	28	4 52.0	4 52.8	4 38.7	28 0.9	88 2.9	148 4.8
29	4 37.3	4 38.0	4 24.6	29 0.9	89 2.7	149 4.6	29	4 52.3	4 53.1	4 38.9	29 0.9	89 2.9	149 4.8
30	4 37.5	4 38.3	4 24.9	30 0.9	90 2.8	150 4.6	30	4 52.5	4 53.3	4 39.2	30 1.0	90 2.9	150 4.9
31	4 37.8	4 38.5	4 25.1	31 1.0	91 2.8	151 4.7	31	4 52.8	4 53.6	4 39.4	31 1.0	91 3.0	151 4.9
32	4 38.0	4 38.8	4 25.3	32 1.0	92 2.8	152 4.7	32	4 53.0	4 53.8	4 39.7	32 1.0	92 3.0	152 4.9
33	4 38.3	4 39.0	4 25.6	33 1.0	93 2.9	153 4.7	33	4 53.3	4 54.1	4 39.9	33 1.1	93 3.0	153 5.0
34	4 38.5	4 39.3	4 25.8	34 1.0	94 2.9	154 4.7	34	4 53.5	4 54.3	4 40.1	34 1.1	94 3.1	154 5.0
35	4 38.8	4 39.5	4 26.1	35 1.1	95 2.9	155 4.8	35	4 53.8	4 54.6	4 40.4	35 1.1	95 3.1	155 5.0
36	4 39.0	4 39.8	4 26.3	36 1.1	96 3.0	156 4.8	36	4 54.0	4 54.8	4 40.6	36 1.2	96 3.1	156 5.1
37	4 39.3	4 40.0	4 26.5	37 1.1	97 3.0	157 4.8	37	4 54.3	4 55.1	4 40.8	37 1.2	97 3.2	157 5.1
38	4 39.5	4 40.3	4 26.8	38 1.2	98 3.0	158 4.9	38	4 54.5	4 55.3	4 41.1	38 1.2	98 3.2	158 5.1
39	4 39.8	4 40.5	4 27.0	39 1.2	99 3.1	159 4.9	39	4 54.8	4 55.6	4 41.3	39 1.3	99 3.2	159 5.2
40	4 40.0	4 40.8	4 27.2	40 1.2	100 3.1	160 4.9	40	4 55.0	4 55.8	4 41.6	40 1.3	100 3.3	160 5.2
41	4 40.3	4 41.0	4 27.5	41 1.3	101 3.1	161 5.0	41	4 55.3	4 56.1	4 41.8	41 1.3	101 3.3	161 5.2
42	4 40.5	4 41.3	4 27.7	42 1.3	102 3.1	162 5.0	42	4 55.5	4 56.3	4 42.0	42 1.4	102 3.3	162 5.3
43	4 40.8	4 41.5	4 28.0	43 1.3	103 3.2	163 5.0	43	4 55.8	4 56.6	4 42.3	43 1.4	103 3.3	163 5.3
44	4 41.0	4 41.8	4 28.2	44 1.4	104 3.2	164 5.1	44	4 56.0	4 56.8	4 42.5	44 1.4	104 3.4	164 5.3
45	4 41.3	4 42.0	4 28.4	45 1.4	105 3.2	165 5.1	45	4 56.3	4 57.1	4 42.8	45 1.5	105 3.4	165 5.4
46	4 41.5	4 42.3	4 28.7	46 1.4	106 3.3	166 5.1	46	4 56.5	4 57.3	4 43.0	46 1.5	106 3.4	166 5.4
47	4 41.8	4 42.5	4 28.9	47 1.4	107 3.3	167 5.1	47	4 56.8	4 57.6	4 43.2	47 1.5	107 3.5	167 5.4
48	4 42.0	4 42.8	4 29.2	48 1.5	108 3.3	168 5.2	48	4 57.0	4 57.8	4 43.5	48 1.6	108 3.5	168 5.5
49	4 42.3	4 43.0	4 29.4	49 1.5	109 3.4	169 5.2	49	4 57.3	4 58.1	4 43.7	49 1.6	109 3.5	169 5.5
50	4 42.5	4 43.3	4 29.6	50 1.5	110 3.4	170 5.2	50	4 57.5	4 58.3	4 43.9	50 1.6	110 3.6	170 5.5
51	4 42.8	4 43.5	4 29.9	51 1.6	111 3.4	171 5.3	51	4 57.8	4 58.6	4 44.2	51 1.7	111 3.6	171 5.6
52	4 43.0	4 43.8	4 30.1	52 1.6	112 3.5	172 5.3	52	4 58.0	4 58.8	4 44.4	52 1.7	112 3.6	172 5.6
53	4 43.3	4 44.0	4 30.3	53 1.6	113 3.5	173 5.3	53	4 58.3	4 59.1	4 44.7	53 1.7	113 3.7	173 5.6
54	4 43.5	4 44.3	4 30.6	54 1.7	114 3.5	174 5.4	54	4 58.5	4 59.3	4 44.9	54 1.8	114 3.7	174 5.7
55	4 43.8	4 44.5	4 30.8	55 1.7	115 3.5	175 5.4	55	4 58.8	4 59.6	4 45.1	55 1.8	115 3.7	175 5.7
56	4 44.0	4 44.8	4 31.1	56 1.7	116 3.6	176 5.4	56	4 59.0	4 59.8	4 45.4	56 1.8	116 3.8	176 5.7
57	4 44.3	4 45.0	4 31.3	57 1.8	117 3.6	177 5.5	57	4 59.3	5 00.1	4 45.6	57 1.9	117 3.8	177 5.8
58	4 44.5	4 45.3	4 31.5	58 1.8	118 3.6	178 5.5	58	4 59.5	5 00.3	4 45.9	58 1.9	118 3.8	178 5.8
59	4 44.8	4 45.5	4 31.8	59 1.8	119 3.7	179 5.5	59	4 59.8	5 00.6	4 46.1	59 1.9	119 3.9	179 5.8
60	4 45.0	4 45.8	4 32.0	60 1.9	120 3.7	180 5.6	60	5 00.0	5 00.8	4 46.3	60 2.0	120 3.9	180 5.9

Sec	SUN PLANET	γ	MOON	code corr'n	code corr'n	code corr'n
0	5 00.0	5 00.8	4 46.3	0 0.0	60 2.1	120 4.1
1	5 00.3	5 01.1	4 46.6	1 0.0	61 2.1	121 4.1
2	5 00.5	5 01.3	4 46.8	2 0.1	62 2.1	122 4.2
3	5 00.8	5 01.6	4 47.0	3 0.1	63 2.2	123 4.2
4	5 01.0	5 01.8	4 47.3	4 0.1	64 2.2	124 4.2
5	5 01.3	5 02.1	4 47.5	5 0.2	65 2.2	125 4.3
6	5 01.5	5 02.3	4 47.8	6 0.2	66 2.3	126 4.3
7	5 01.8	5 02.6	4 48.0	7 0.2	67 2.3	127 4.3
8	5 02.0	5 02.8	4 48.2	8 0.3	68 2.3	128 4.4
9	5 02.3	5 03.1	4 48.5	9 0.3	69 2.4	129 4.4
10	5 02.5	5 03.3	4 48.7	10 0.3	70 2.4	130 4.4
11	5 02.8	5 03.6	4 49.0	11 0.4	71 2.4	131 4.5
12	5 03.0	5 03.8	4 49.2	12 0.4	72 2.5	132 4.5
13	5 03.3	5 04.1	4 49.4	13 0.4	73 2.5	133 4.5
14	5 03.5	5 04.3	4 49.7	14 0.5	74 2.5	134 4.6
15	5 03.8	5 04.6	4 49.9	15 0.5	75 2.6	135 4.6
16	5 04.0	5 04.8	4 50.2	16 0.5	76 2.6	136 4.6
17	5 04.3	5 05.1	4 50.4	17 0.6	77 2.6	137 4.7
18	5 04.5	5 05.3	4 50.6	18 0.6	78 2.7	138 4.7
19	5 04.8	5 05.6	4 50.9	19 0.6	79 2.7	139 4.7
20	5 05.0	5 05.8	4 51.1	20 0.7	80 2.7	140 4.8
21	5 05.3	5 06.1	4 51.3	21 0.7	81 2.8	141 4.8
22	5 05.5	5 06.3	4 51.6	22 0.8	82 2.8	142 4.9
23	5 05.8	5 06.6	4 51.8	23 0.8	83 2.8	143 4.9
24	5 06.0	5 06.8	4 52.1	24 0.8	84 2.9	144 4.9
25	5 06.3	5 07.1	4 52.3	25 0.9	85 2.9	145 5.0
26	5 06.5	5 07.3	4 52.5	26 0.9	86 2.9	146 5.0
27	5 06.8	5 07.6	4 52.8	27 0.9	87 3.0	147 5.0
28	5 07.0	5 07.8	4 53.0	28 1.0	88 3.0	148 5.1
29	5 07.3	5 08.1	4 53.3	29 1.0	89 3.0	149 5.1
30	5 07.5	5 08.3	4 53.5	30 1.0	90 3.1	150 5.1
31	5 07.8	5 08.6	4 53.7	31 1.1	91 3.1	151 5.2
32	5 08.0	5 08.8	4 54.0	32 1.1	92 3.1	152 5.2
33	5 08.3	5 09.1	4 54.2	33 1.1	93 3.2	153 5.2
34	5 08.5	5 09.3	4 54.4	34 1.2	94 3.2	154 5.3
35	5 08.8	5 09.6	4 54.7	35 1.2	95 3.2	155 5.3
36	5 09.0	5 09.8	4 54.9	36 1.2	96 3.3	156 5.3
37	5 09.3	5 10.1	4 55.2	37 1.3	97 3.3	157 5.4
38	5 09.5	5 10.3	4 55.4	38 1.3	98 3.3	158 5.4
39	5 09.8	5 10.6	4 55.6	39 1.3	99 3.4	159 5.4
40	5 10.0	5 10.8	4 55.9	40 1.4	100 3.4	160 5.5
41	5 10.3	5 11.1	4 56.1	41 1.4	101 3.5	161 5.5
42	5 10.5	5 11.4	4 56.4	42 1.4	102 3.5	162 5.5
43	5 10.8	5 11.6	4 56.6	43 1.5	103 3.5	163 5.6
44	5 11.0	5 11.9	4 56.8	44 1.5	104 3.6	164 5.6
45	5 11.3	5 12.1	4 57.1	45 1.5	105 3.6	165 5.6
46	5 11.5	5 12.4	4 57.3	46 1.6	106 3.6	166 5.7
47	5 11.8	5 12.6	4 57.5	47 1.6	107 3.7	167 5.7
48	5 12.0	5 12.9	4 57.8	48 1.6	108 3.7	168 5.7
49	5 12.3	5 13.1	4 58.0	49 1.7	109 3.7	169 5.8
50	5 12.5	5 13.4	4 58.3	50 1.7	110 3.8	170 5.8
51	5 12.8	5 13.6	4 58.5	51 1.7	111 3.8	171 5.8
52	5 13.0	5 13.9	4 58.7	52 1.8	112 3.8	172 5.9
53	5 13.3	5 14.1	4 59.0	53 1.8	113 3.9	173 5.9
54	5 13.5	5 14.4	4 59.2	54 1.8	114 3.9	174 5.9
55	5 13.8	5 14.6	4 59.5	55 1.9	115 3.9	175 6.0
56	5 14.0	5 14.9	4 59.7	56 1.9	116 4.0	176 6.0
57	5 14.3	5 15.1	4 59.9	57 1.9	117 4.0	177 6.0
58	5 14.5	5 15.4	5 00.2	58 2.0	118 4.0	178 6.1
59	5 14.8	5 15.6	5 00.4	59 2.0	119 4.1	179 6.1
60	5 15.0	5 15.9	5 00.7	60 2.1	120 4.1	180 6.2

Sec	SUN PLANET	γ	MOON	code corr'n	code corr'n	code corr'n
0	5 15.0	5 15.9	5 00.7	0 0.0	60 2.2	120 4.3
1	5 15.3	5 16.1	5 00.9	1 0.0	61 2.2	121 4.3
2	5 15.5	5 16.4	5 01.1	2 0.1	62 2.2	122 4.4
3	5 15.8	5 16.6	5 01.4	3 0.1	63 2.3	123 4.4
4	5 16.0	5 16.9	5 01.6	4 0.1	64 2.3	124 4.4
5	5 16.3	5 17.1	5 01.8	5 0.2	65 2.3	125 4.5
6	5 16.5	5 17.4	5 02.1	6 0.2	66 2.4	126 4.5
7	5 16.8	5 17.6	5 02.3	7 0.3	67 2.4	127 4.6
8	5 17.0	5 17.9	5 02.6	8 0.3	68 2.4	128 4.6
9	5 17.3	5 18.1	5 02.8	9 0.3	69 2.5	129 4.6
10	5 17.5	5 18.4	5 03.0	10 0.4	70 2.5	130 4.7
11	5 17.8	5 18.6	5 03.3	11 0.4	71 2.5	131 4.7
12	5 18.0	5 18.9	5 03.5	12 0.4	72 2.6	132 4.7
13	5 18.3	5 19.1	5 03.8	13 0.5	73 2.6	133 4.8
14	5 18.5	5 19.4	5 04.0	14 0.5	74 2.7	134 4.8
15	5 18.8	5 19.6	5 04.2	15 0.5	75 2.7	135 4.8
16	5 19.0	5 19.9	5 04.5	16 0.6	76 2.7	136 4.9
17	5 19.3	5 20.1	5 04.7	17 0.6	77 2.8	137 4.9
18	5 19.5	5 20.4	5 04.9	18 0.6	78 2.8	138 4.9
19	5 19.8	5 20.6	5 05.2	19 0.7	79 2.8	139 5.0
20	5 20.0	5 20.9	5 05.4	20 0.7	80 2.9	140 5.0
21	5 20.3	5 21.1	5 05.7	21 0.8	81 2.9	141 5.1
22	5 20.5	5 21.4	5 05.9	22 0.8	82 2.9	142 5.1
23	5 20.8	5 21.6	5 06.1	23 0.8	83 3.0	143 5.1
24	5 21.0	5 21.9	5 06.4	24 0.9	84 3.0	144 5.2
25	5 21.3	5 22.1	5 06.6	25 0.9	85 3.0	145 5.2
26	5 21.5	5 22.4	5 06.9	26 0.9	86 3.1	146 5.2
27	5 21.8	5 22.6	5 07.1	27 1.0	87 3.1	147 5.3
28	5 22.0	5 22.9	5 07.3	28 1.0	88 3.2	148 5.3
29	5 22.3	5 23.1	5 07.6	29 1.0	89 3.2	149 5.3
30	5 22.5	5 23.4	5 07.8	30 1.1	90 3.2	150 5.4
31	5 22.8	5 23.6	5 08.0	31 1.1	91 3.3	151 5.4
32	5 23.0	5 23.9	5 08.3	32 1.1	92 3.3	152 5.4
33	5 23.3	5 24.1	5 08.5	33 1.2	93 3.3	153 5.5
34	5 23.5	5 24.4	5 08.8	34 1.2	94 3.4	154 5.5
35	5 23.8	5 24.6	5 09.0	35 1.3	95 3.4	155 5.6
36	5 24.0	5 24.9	5 09.2	36 1.3	96 3.4	156 5.6
37	5 24.3	5 25.1	5 09.5	37 1.3	97 3.5	157 5.6
38	5 24.5	5 25.4	5 09.7	38 1.4	98 3.5	158 5.7
39	5 24.8	5 25.6	5 10.0	39 1.4	99 3.5	159 5.7
40	5 25.0	5 25.9	5 10.2	40 1.4	100 3.6	160 5.7
41	5 25.3	5 26.1	5 10.4	41 1.5	101 3.6	161 5.8
42	5 25.5	5 26.4	5 10.7	42 1.5	102 3.7	162 5.8
43	5 25.8	5 26.6	5 10.9	43 1.5	103 3.7	163 5.8
44	5 26.0	5 26.9	5 11.1	44 1.6	104 3.7	164 5.9
45	5 26.3	5 27.1	5 11.4	45 1.6	105 3.8	165 5.9
46	5 26.5	5 27.4	5 11.6	46 1.6	106 3.8	166 5.9
47	5 26.8	5 27.6	5 11.9	47 1.7	107 3.8	167 6.0
48	5 27.0	5 27.9	5 12.1	48 1.7	108 3.9	168 6.0
49	5 27.3	5 28.1	5 12.3	49 1.8	109 3.9	169 6.1
50	5 27.5	5 28.4	5 12.6	50 1.8	110 3.9	170 6.1
51	5 27.8	5 28.6	5 12.8	51 1.8	111 4.0	171 6.1
52	5 28.0	5 28.9	5 13.1	52 1.9	112 4.0	172 6.2
53	5 28.3	5 29.1	5 13.3	53 1.9	113 4.0	173 6.2
54	5 28.5	5 29.4	5 13.5	54 1.9	114 4.1	174 6.2
55	5 28.8	5 29.7	5 13.8	55 2.0	115 4.1	175 6.3
56	5 29.0	5 29.9	5 14.0	56 2.0	116 4.2	176 6.3
57	5 29.3	5 30.2	5 14.3	57 2.0	117 4.2	177 6.3
58	5 29.5	5 30.4	5 14.5	58 2.1	118 4.2	178 6.4
59	5 29.8	5 30.7	5 14.7	59 2.1	119 4.3	179 6.4
60	5 30.0	5 30.9	5 15.0	60 2.2	120 4.3	180 6.5

Sec.	SUN PLANET	☿	MOON	code	corr'n	code	corr'n	code	corr'n	Sec.	SUN PLANET	☿	MOON	code	corr'n	code	corr'n	code	corr'n
0	5 30.0	5 30.9	5 15.0	0 0.0	60 2.3	120 4.5		0	5 45.0	5 45.9	5 29.3	0 0.0	60 2.4	120 4.7					
1	5 30.3	5 31.2	5 15.2	1 0.0	61 2.3	121 4.5		1	5 45.3	5 46.2	5 29.5	1 0.0	61 2.4	121 4.7					
2	5 30.5	5 31.4	5 15.4	2 0.1	62 2.3	122 4.6		2	5 45.5	5 46.4	5 29.8	2 0.1	62 2.4	122 4.8					
3	5 30.8	5 31.7	5 15.7	3 0.1	63 2.4	123 4.6		3	5 45.8	5 46.7	5 30.0	3 0.1	63 2.5	123 4.8					
4	5 31.0	5 31.9	5 15.9	4 0.2	64 2.4	124 4.7		4	5 46.0	5 46.9	5 30.2	4 0.2	64 2.5	124 4.9					
5	5 31.3	5 32.2	5 16.2	5 0.2	65 2.4	125 4.7		5	5 46.3	5 47.2	5 30.5	5 0.2	65 2.5	125 4.9					
6	5 31.5	5 32.4	5 16.4	6 0.2	66 2.5	126 4.7		6	5 46.5	5 47.4	5 30.7	6 0.2	66 2.6	126 4.9					
7	5 31.8	5 32.7	5 16.6	7 0.3	67 2.5	127 4.8		7	5 46.8	5 47.7	5 31.0	7 0.3	67 2.6	127 5.0					
8	5 32.0	5 32.9	5 16.9	8 0.3	68 2.6	128 4.8		8	5 47.0	5 48.0	5 31.2	8 0.3	68 2.7	128 5.0					
9	5 32.3	5 33.2	5 17.1	9 0.3	69 2.6	129 4.8		9	5 47.3	5 48.2	5 31.4	9 0.4	69 2.7	129 5.1					
10	5 32.5	5 33.4	5 17.4	10 0.4	70 2.6	130 4.9		10	5 47.5	5 48.5	5 31.7	10 0.4	70 2.7	130 5.1					
11	5 32.8	5 33.7	5 17.6	11 0.4	71 2.7	131 4.9		11	5 47.8	5 48.7	5 31.9	11 0.4	71 2.8	131 5.1					
12	5 33.0	5 33.9	5 17.8	12 0.5	72 2.7	132 5.0		12	5 48.0	5 49.0	5 32.1	12 0.5	72 2.8	132 5.2					
13	5 33.3	5 34.2	5 18.1	13 0.5	73 2.7	133 5.0		13	5 48.3	5 49.2	5 32.4	13 0.5	73 2.9	133 5.2					
14	5 33.5	5 34.4	5 18.3	14 0.5	74 2.8	134 5.0		14	5 48.5	5 49.5	5 32.6	14 0.5	74 2.9	134 5.2					
15	5 33.8	5 34.7	5 18.5	15 0.6	75 2.8	135 5.1		15	5 48.8	5 49.7	5 32.9	15 0.6	75 2.9	135 5.3					
16	5 34.0	5 34.9	5 18.8	16 0.6	76 2.9	136 5.1		16	5 49.0	5 50.0	5 33.1	16 0.6	76 3.0	136 5.3					
17	5 34.3	5 35.2	5 19.0	17 0.6	77 2.9	137 5.1		17	5 49.3	5 50.2	5 33.3	17 0.7	77 3.0	137 5.4					
18	5 34.5	5 35.4	5 19.3	18 0.7	78 2.9	138 5.2		18	5 49.5	5 50.5	5 33.6	18 0.7	78 3.1	138 5.4					
19	5 34.8	5 35.7	5 19.5	19 0.7	79 3.0	139 5.2		19	5 49.8	5 50.7	5 33.8	19 0.7	79 3.1	139 5.4					
20	5 35.0	5 35.9	5 19.7	20 0.8	80 3.0	140 5.3		20	5 50.0	5 51.0	5 34.1	20 0.8	80 3.1	140 5.5					
21	5 35.3	5 36.2	5 20.0	21 0.8	81 3.0	141 5.3		21	5 50.3	5 51.2	5 34.3	21 0.8	81 3.2	141 5.5					
22	5 35.5	5 36.4	5 20.2	22 0.8	82 3.1	142 5.3		22	5 50.5	5 51.5	5 34.5	22 0.9	82 3.2	142 5.6					
23	5 35.8	5 36.7	5 20.5	23 0.9	83 3.1	143 5.4		23	5 50.8	5 51.7	5 34.8	23 0.9	83 3.3	143 5.6					
24	5 36.0	5 36.9	5 20.7	24 0.9	84 3.2	144 5.4		24	5 51.0	5 52.0	5 35.0	24 0.9	84 3.3	144 5.6					
25	5 36.3	5 37.2	5 20.9	25 0.9	85 3.2	145 5.4		25	5 51.3	5 52.2	5 35.2	25 1.0	85 3.3	145 5.7					
26	5 36.5	5 37.4	5 21.2	26 1.0	86 3.2	146 5.5		26	5 51.5	5 52.5	5 35.5	26 1.0	86 3.4	146 5.7					
27	5 36.8	5 37.7	5 21.4	27 1.0	87 3.3	147 5.5		27	5 51.8	5 52.7	5 35.7	27 1.1	87 3.4	147 5.8					
28	5 37.0	5 37.9	5 21.6	28 1.1	88 3.3	148 5.6		28	5 52.0	5 53.0	5 36.0	28 1.1	88 3.4	148 5.8					
29	5 37.3	5 38.2	5 21.9	29 1.1	89 3.3	149 5.6		29	5 52.3	5 53.2	5 36.2	29 1.1	89 3.5	149 5.8					
30	5 37.5	5 38.4	5 22.1	30 1.1	90 3.4	150 5.6		30	5 52.5	5 53.5	5 36.4	30 1.2	90 3.5	150 5.9					
31	5 37.8	5 38.7	5 22.4	31 1.2	91 3.4	151 5.7		31	5 52.8	5 53.7	5 36.7	31 1.2	91 3.6	151 5.9					
32	5 38.0	5 38.9	5 22.6	32 1.2	92 3.5	152 5.7		32	5 53.0	5 54.0	5 36.9	32 1.3	92 3.6	152 6.0					
33	5 38.3	5 39.2	5 22.8	33 1.2	93 3.5	153 5.7		33	5 53.3	5 54.2	5 37.2	33 1.3	93 3.6	153 6.0					
34	5 38.5	5 39.4	5 23.1	34 1.3	94 3.5	154 5.8		34	5 53.5	5 54.5	5 37.4	34 1.3	94 3.7	154 6.0					
35	5 38.8	5 39.7	5 23.3	35 1.3	95 3.6	155 5.8		35	5 53.8	5 54.7	5 37.6	35 1.4	95 3.7	155 6.1					
36	5 39.0	5 39.9	5 23.6	36 1.4	96 3.6	156 5.9		36	5 54.0	5 55.0	5 37.9	36 1.4	96 3.8	156 6.1					
37	5 39.3	5 40.2	5 23.8	37 1.4	97 3.6	157 5.9		37	5 54.3	5 55.2	5 38.1	37 1.4	97 3.8	157 6.1					
38	5 39.5	5 40.4	5 24.0	38 1.4	98 3.7	158 5.9		38	5 54.5	5 55.5	5 38.4	38 1.5	98 3.8	158 6.2					
39	5 39.8	5 40.7	5 24.3	39 1.5	99 3.7	159 6.0		39	5 54.8	5 55.7	5 38.6	39 1.5	99 3.9	159 6.2					
40	5 40.0	5 40.9	5 24.5	40 1.5	100 3.8	160 6.0		40	5 55.0	5 56.0	5 38.8	40 1.6	100 3.9	160 6.3					
41	5 40.3	5 41.2	5 24.7	41 1.5	101 3.8	161 6.0		41	5 55.3	5 56.2	5 39.1	41 1.6	101 4.0	161 6.3					
42	5 40.5	5 41.4	5 25.0	42 1.6	102 3.8	162 6.1		42	5 55.5	5 56.5	5 39.3	42 1.6	102 4.0	162 6.3					
43	5 40.8	5 41.7	5 25.2	43 1.6	103 3.9	163 6.1		43	5 55.8	5 56.7	5 39.5	43 1.7	103 4.0	163 6.4					
44	5 41.0	5 41.9	5 25.5	44 1.7	104 3.9	164 6.2		44	5 56.0	5 57.0	5 39.8	44 1.7	104 4.1	164 6.4					
45	5 41.3	5 42.2	5 25.7	45 1.7	105 3.9	165 6.2		45	5 56.3	5 57.2	5 40.0	45 1.8	105 4.1	165 6.5					
46	5 41.5	5 42.4	5 25.9	46 1.7	106 4.0	166 6.2		46	5 56.5	5 57.5	5 40.3	46 1.8	106 4.2	166 6.5					
47	5 41.8	5 42.7	5 26.2	47 1.8	107 4.0	167 6.3		47	5 56.8	5 57.7	5 40.5	47 1.8	107 4.2	167 6.5					
48	5 42.0	5 42.9	5 26.4	48 1.8	108 4.1	168 6.3		48	5 57.0	5 58.0	5 40.7	48 1.9	108 4.2	168 6.6					
49	5 42.3	5 43.2	5 26.7	49 1.8	109 4.1	169 6.3		49	5 57.3	5 58.2	5 41.0	49 1.9	109 4.3	169 6.6					
50	5 42.5	5 43.4	5 26.9	50 1.9	110 4.1	170 6.4		50	5 57.5	5 58.5	5 41.2	50 2.0	110 4.3	170 6.7					
51	5 42.8	5 43.7	5 27.1	51 1.9	111 4.2	171 6.4		51	5 57.8	5 58.7	5 41.5	51 2.0	111 4.3	171 6.7					
52	5 43.0	5 43.9	5 27.4	52 2.0	112 4.2	172 6.5		52	5 58.0	5 59.0	5 41.7	52 2.0	112 4.4	172 6.7					
53	5 43.3	5 44.2	5 27.6	53 2.0	113 4.2	173 6.5		53	5 58.3	5 59.2	5 41.9	53 2.1	113 4.4	173 6.8					
54	5 43.5	5 44.4	5 27.9	54 2.0	114 4.3	174 6.5		54	5 58.5	5 59.5	5 42.2	54 2.1	114 4.5	174 6.8					
55	5 43.8	5 44.7	5 28.1	55 2.1	115 4.3	175 6.6		55	5 58.8	5 59.7	5 42.4	55 2.2	115 4.5	175 6.9					
56	5 44.0	5 44.9	5 28.3	56 2.1	116 4.4	176 6.6		56	5 59.0	6 00.0	5 42.6	56 2.2	116 4.5	176 6.9					
57	5 44.3	5 45.2	5 28.6	57 2.1	117 4.4	177 6.6		57	5 59.3	6 00.2	5 42.9	57 2.2	117 4.6	177 6.9					
58	5 44.5	5 45.4	5 28.8	58 2.2	118 4.4	178 6.7		58	5 59.5	6 00.5	5 43.1	58 2.3	118 4.6	178 7.0					
59	5 44.8	5 45.7	5 29.0	59 2.2	119 4.5	179 6.7		59	5 59.8	6 00.7	5 43.4	59 2.3	119 4.7	179 7.0					
60	5 45.0	5 45.9	5 29.3	60 2.3	120 4.5	180 6.8		60	6 00.0	6 01.0	5 43.6	60 2.4	120 4.7	180 7.1					

Sec.	SUN PLANET	☿	MOON	code corr'n	code corr'n	code corr'n	Sec.	SUN PLANET	☿	MOON	code corr'n	code corr'n	code corr'n
0	6 00.0	6 01.0	5 43.6	0 0.0	60 2.5	120 4.9	0	6 15.0	6 16.0	5 57.9	0 0.0	60 2.6	120 5.1
1	6 00.3	6 01.2	5 43.8	1 0.0	61 2.5	121 4.9	1	6 15.3	6 16.3	5 58.2	1 0.0	61 2.6	121 5.1
2	6 00.5	6 01.5	5 44.1	2 0.1	62 2.5	122 5.0	2	6 15.5	6 16.5	5 58.4	2 0.1	62 2.6	122 5.2
3	6 00.8	6 01.7	5 44.3	3 0.1	63 2.6	123 5.0	3	6 15.8	6 16.8	5 58.6	3 0.1	63 2.7	123 5.2
4	6 01.0	6 02.0	5 44.6	4 0.2	64 2.6	124 5.1	4	6 16.0	6 17.0	5 58.9	4 0.2	64 2.7	124 5.3
5	6 01.3	6 02.2	5 44.8	5 0.2	65 2.7	125 5.1	5	6 16.3	6 17.3	5 59.1	5 0.2	65 2.8	125 5.3
6	6 01.5	6 02.5	5 45.0	6 0.2	66 2.7	126 5.1	6	6 16.5	6 17.5	5 59.3	6 0.3	66 2.8	126 5.4
7	6 01.8	6 02.7	5 45.3	7 0.3	67 2.7	127 5.2	7	6 16.8	6 17.8	5 59.6	7 0.3	67 2.8	127 5.4
8	6 02.0	6 03.0	5 45.5	8 0.3	68 2.8	128 5.2	8	6 17.0	6 18.0	5 59.8	8 0.3	68 2.9	128 5.4
9	6 02.3	6 03.2	5 45.7	9 0.4	69 2.8	129 5.3	9	6 17.3	6 18.3	6 00.1	9 0.4	69 2.9	129 5.5
10	6 02.5	6 03.5	5 46.0	10 0.4	70 2.9	130 5.3	10	6 17.5	6 18.5	6 00.3	10 0.4	70 3.0	130 5.5
11	6 02.8	6 03.7	5 46.2	11 0.4	71 2.9	131 5.3	11	6 17.8	6 18.8	6 00.5	11 0.5	71 3.0	131 5.6
12	6 03.0	6 04.0	5 46.5	12 0.5	72 2.9	132 5.4	12	6 18.0	6 19.0	6 00.8	12 0.5	72 3.1	132 5.6
13	6 03.3	6 04.2	5 46.7	13 0.5	73 3.0	133 5.4	13	6 18.3	6 19.3	6 01.0	13 0.6	73 3.1	133 5.7
14	6 03.5	6 04.5	5 46.9	14 0.6	74 3.0	134 5.5	14	6 18.5	6 19.5	6 01.3	14 0.6	74 3.1	134 5.7
15	6 03.8	6 04.7	5 47.2	15 0.6	75 3.1	135 5.5	15	6 18.8	6 19.8	6 01.5	15 0.6	75 3.2	135 5.7
16	6 04.0	6 05.0	5 47.4	16 0.7	76 3.1	136 5.6	16	6 19.0	6 20.0	6 01.7	16 0.7	76 3.2	136 5.8
17	6 04.3	6 05.2	5 47.7	17 0.7	77 3.1	137 5.6	17	6 19.3	6 20.3	6 02.0	17 0.7	77 3.3	137 5.8
18	6 04.5	6 05.5	5 47.9	18 0.7	78 3.2	138 5.6	18	6 19.5	6 20.5	6 02.2	18 0.8	78 3.3	138 5.9
19	6 04.8	6 05.7	5 48.1	19 0.8	79 3.2	139 5.7	19	6 19.8	6 20.8	6 02.5	19 0.8	79 3.4	139 5.9
20	6 05.0	6 06.0	5 48.4	20 0.8	80 3.3	140 5.7	20	6 20.0	6 21.0	6 02.7	20 0.9	80 3.4	140 6.0
21	6 05.3	6 06.3	5 48.6	21 0.9	81 3.3	141 5.8	21	6 20.3	6 21.3	6 02.9	21 0.9	81 3.4	141 6.0
22	6 05.5	6 06.5	5 48.8	22 0.9	82 3.3	142 5.8	22	6 20.5	6 21.5	6 03.2	22 0.9	82 3.5	142 6.0
23	6 05.8	6 06.8	5 49.1	23 0.9	83 3.4	143 5.8	23	6 20.8	6 21.8	6 03.4	23 1.0	83 3.5	143 6.1
24	6 06.0	6 07.0	5 49.3	24 1.0	84 3.4	144 5.9	24	6 21.0	6 22.0	6 03.6	24 1.0	84 3.6	144 6.1
25	6 06.3	6 07.3	5 49.6	25 1.0	85 3.5	145 5.9	25	6 21.3	6 22.3	6 03.9	25 1.1	85 3.6	145 6.2
26	6 06.5	6 07.5	5 49.8	26 1.1	86 3.5	146 6.0	26	6 21.5	6 22.5	6 04.1	26 1.1	86 3.7	146 6.2
27	6 06.8	6 07.8	5 50.0	27 1.1	87 3.6	147 6.0	27	6 21.8	6 22.8	6 04.4	27 1.1	87 3.7	147 6.2
28	6 07.0	6 08.0	5 50.3	28 1.1	88 3.6	148 6.0	28	6 22.0	6 23.0	6 04.6	28 1.2	88 3.7	148 6.3
29	6 07.3	6 08.3	5 50.5	29 1.2	89 3.6	149 6.1	29	6 22.3	6 23.3	6 04.8	29 1.2	89 3.8	149 6.3
30	6 07.5	6 08.5	5 50.8	30 1.2	90 3.7	150 6.1	30	6 22.5	6 23.5	6 05.1	30 1.3	90 3.8	150 6.4
31	6 07.8	6 08.8	5 51.0	31 1.3	91 3.7	151 6.2	31	6 22.8	6 23.8	6 05.3	31 1.3	91 3.9	151 6.4
32	6 08.0	6 09.0	5 51.2	32 1.3	92 3.8	152 6.2	32	6 23.0	6 24.0	6 05.6	32 1.4	92 3.9	152 6.5
33	6 08.3	6 09.3	5 51.5	33 1.3	93 3.8	153 6.2	33	6 23.3	6 24.3	6 05.8	33 1.4	93 4.0	153 6.5
34	6 08.5	6 09.5	5 51.7	34 1.4	94 3.8	154 6.3	34	6 23.5	6 24.5	6 06.0	34 1.4	94 4.0	154 6.5
35	6 08.8	6 09.8	5 52.0	35 1.4	95 3.9	155 6.3	35	6 23.8	6 24.8	6 06.3	35 1.5	95 4.0	155 6.6
36	6 09.0	6 10.0	5 52.2	36 1.5	96 3.9	156 6.4	36	6 24.0	6 25.1	6 06.5	36 1.5	96 4.1	156 6.6
37	6 09.3	6 10.3	5 52.4	37 1.5	97 4.0	157 6.4	37	6 24.3	6 25.3	6 06.7	37 1.6	97 4.1	157 6.7
38	6 09.5	6 10.5	5 52.7	38 1.6	98 4.0	158 6.5	38	6 24.5	6 25.6	6 07.0	38 1.6	98 4.2	158 6.7
39	6 09.8	6 10.8	5 52.9	39 1.6	99 4.0	159 6.5	39	6 24.8	6 25.8	6 07.2	39 1.7	99 4.2	159 6.8
40	6 10.0	6 11.0	5 53.1	40 1.6	100 4.1	160 6.5	40	6 25.0	6 26.1	6 07.5	40 1.7	100 4.3	160 6.8
41	6 10.3	6 11.3	5 53.4	41 1.7	101 4.1	161 6.6	41	6 25.3	6 26.3	6 07.7	41 1.7	101 4.3	161 6.8
42	6 10.5	6 11.5	5 53.6	42 1.7	102 4.2	162 6.6	42	6 25.5	6 26.6	6 07.9	42 1.8	102 4.3	162 6.9
43	6 10.8	6 11.8	5 53.9	43 1.8	103 4.2	163 6.7	43	6 25.8	6 26.8	6 08.2	43 1.8	103 4.4	163 6.9
44	6 11.0	6 12.0	5 54.1	44 1.8	104 4.2	164 6.7	44	6 26.0	6 27.1	6 08.4	44 1.9	104 4.4	164 7.0
45	6 11.3	6 12.3	5 54.3	45 1.8	105 4.3	165 6.7	45	6 26.3	6 27.3	6 08.7	45 1.9	105 4.5	165 7.0
46	6 11.5	6 12.5	5 54.6	46 1.9	106 4.3	166 6.8	46	6 26.5	6 27.6	6 08.9	46 2.0	106 4.5	166 7.1
47	6 11.8	6 12.8	5 54.8	47 1.9	107 4.4	167 6.8	47	6 26.8	6 27.8	6 09.1	47 2.0	107 4.5	167 7.1
48	6 12.0	6 13.0	5 55.1	48 2.0	108 4.4	168 6.9	48	6 27.0	6 28.1	6 09.4	48 2.0	108 4.6	168 7.1
49	6 12.3	6 13.3	5 55.3	49 2.0	109 4.5	169 6.9	49	6 27.3	6 28.3	6 09.6	49 2.1	109 4.6	169 7.2
50	6 12.5	6 13.5	5 55.5	50 2.0	110 4.5	170 6.9	50	6 27.5	6 28.6	6 09.8	50 2.1	110 4.7	170 7.2
51	6 12.8	6 13.8	5 55.8	51 2.1	111 4.5	171 7.0	51	6 27.8	6 28.8	6 10.1	51 2.2	111 4.7	171 7.3
52	6 13.0	6 14.0	5 56.0	52 2.1	112 4.6	172 7.0	52	6 28.0	6 29.1	6 10.3	52 2.2	112 4.8	172 7.3
53	6 13.3	6 14.3	5 56.2	53 2.2	113 4.6	173 7.1	53	6 28.3	6 29.3	6 10.6	53 2.3	113 4.8	173 7.4
54	6 13.5	6 14.5	5 56.5	54 2.2	114 4.7	174 7.1	54	6 28.5	6 29.6	6 10.8	54 2.3	114 4.8	174 7.4
55	6 13.8	6 14.8	5 56.7	55 2.2	115 4.7	175 7.1	55	6 28.8	6 29.8	6 11.0	55 2.3	115 4.9	175 7.4
56	6 14.0	6 15.0	5 57.0	56 2.3	116 4.7	176 7.2	56	6 29.0	6 30.1	6 11.3	56 2.4	116 4.9	176 7.5
57	6 14.3	6 15.3	5 57.2	57 2.3	117 4.8	177 7.2	57	6 29.3	6 30.3	6 11.5	57 2.4	117 5.0	177 7.5
58	6 14.5	6 15.5	5 57.4	58 2.4	118 4.8	178 7.3	58	6 29.5	6 30.6	6 11.8	58 2.5	118 5.0	178 7.6
59	6 14.8	6 15.8	5 57.7	59 2.4	119 4.9	179 7.3	59	6 29.8	6 30.8	6 12.0	59 2.5	119 5.1	179 7.6
60	6 15.0	6 16.0	5 57.9	60 2.5	120 4.9	180 7.4	60	6 30.0	6 31.1	6 12.2	60 2.6	120 5.1	180 7.7

Sec.	SUN PLANET	☿	MOON	code	corr'n	code	corr'n	code	corr'n	Sec.	SUN PLANET	☿	MOON	code	corr'n	code	corr'n	code	corr'n
0	6 30.0	6 31.1	6 12.2	0	0.0	60	2.7	120	5.3	0	6 45.0	6 46.1	6 26.6	0	0.0	60	2.8	120	5.5
1	6 30.3	6 31.3	6 12.5	1	0.0	61	2.7	121	5.3	1	6 45.3	6 46.4	6 26.8	1	0.0	61	2.8	121	5.5
2	6 30.5	6 31.6	6 12.7	2	0.1	62	2.7	122	5.4	2	6 45.5	6 46.6	6 27.0	2	0.1	62	2.8	122	5.6
3	6 30.8	6 31.8	6 12.9	3	0.1	63	2.8	123	5.4	3	6 45.8	6 46.9	6 27.3	3	0.1	63	2.9	123	5.6
4	6 31.0	6 32.1	6 13.2	4	0.2	64	2.8	124	5.5	4	6 46.0	6 47.1	6 27.5	4	0.2	64	2.9	124	5.7
5	6 31.3	6 32.3	6 13.4	5	0.2	65	2.9	125	5.5	5	6 46.3	6 47.4	6 27.7	5	0.2	65	3.0	125	5.7
6	6 31.5	6 32.6	6 13.7	6	0.3	66	2.9	126	5.6	6	6 46.5	6 47.6	6 28.0	6	0.3	66	3.0	126	5.8
7	6 31.8	6 32.8	6 13.9	7	0.3	67	3.0	127	5.6	7	6 46.8	6 47.9	6 28.2	7	0.3	67	3.1	127	5.8
8	6 32.0	6 33.1	6 14.1	8	0.4	68	3.0	128	5.7	8	6 47.0	6 48.1	6 28.5	8	0.4	68	3.1	128	5.9
9	6 32.3	6 33.3	6 14.4	9	0.4	69	3.0	129	5.7	9	6 47.3	6 48.4	6 28.7	9	0.4	69	3.2	129	5.9
10	6 32.5	6 33.6	6 14.6	10	0.4	70	3.1	130	5.7	10	6 47.5	6 48.6	6 28.9	10	0.5	70	3.2	130	6.0
11	6 32.8	6 33.8	6 14.9	11	0.5	71	3.1	131	5.8	11	6 47.8	6 48.9	6 29.2	11	0.5	71	3.3	131	6.0
12	6 33.0	6 34.1	6 15.1	12	0.5	72	3.2	132	5.8	12	6 48.0	6 49.1	6 29.4	12	0.6	72	3.3	132	6.1
13	6 33.3	6 34.3	6 15.3	13	0.6	73	3.2	133	5.9	13	6 48.3	6 49.4	6 29.7	13	0.6	73	3.3	133	6.1
14	6 33.5	6 34.6	6 15.6	14	0.6	74	3.3	134	5.9	14	6 48.5	6 49.6	6 29.9	14	0.6	74	3.4	134	6.1
15	6 33.8	6 34.8	6 15.8	15	0.7	75	3.3	135	6.0	15	6 48.8	6 49.9	6 30.1	15	0.7	75	3.4	135	6.2
16	6 34.0	6 35.1	6 16.1	16	0.7	76	3.4	136	6.0	16	6 49.0	6 50.1	6 30.4	16	0.7	76	3.5	136	6.2
17	6 34.3	6 35.3	6 16.3	17	0.8	77	3.4	137	6.1	17	6 49.3	6 50.4	6 30.6	17	0.8	77	3.5	137	6.3
18	6 34.5	6 35.6	6 16.5	18	0.8	78	3.4	138	6.1	18	6 49.5	6 50.6	6 30.8	18	0.8	78	3.6	138	6.3
19	6 34.8	6 35.8	6 16.8	19	0.8	79	3.5	139	6.1	19	6 49.8	6 50.9	6 31.1	19	0.9	79	3.6	139	6.4
20	6 35.0	6 36.1	6 17.0	20	0.9	80	3.5	140	6.2	20	6 50.0	6 51.1	6 31.3	20	0.9	80	3.7	140	6.4
21	6 35.3	6 36.3	6 17.2	21	0.9	81	3.6	141	6.2	21	6 50.3	6 51.4	6 31.6	21	1.0	81	3.7	141	6.5
22	6 35.5	6 36.6	6 17.5	22	1.0	82	3.6	142	6.3	22	6 50.5	6 51.6	6 31.8	22	1.0	82	3.8	142	6.5
23	6 35.8	6 36.8	6 17.7	23	1.0	83	3.7	143	6.3	23	6 50.8	6 51.9	6 32.0	23	1.1	83	3.8	143	6.6
24	6 36.0	6 37.1	6 18.0	24	1.1	84	3.7	144	6.4	24	6 51.0	6 52.1	6 32.3	24	1.1	84	3.9	144	6.6
25	6 36.3	6 37.3	6 18.2	25	1.1	85	3.8	145	6.4	25	6 51.3	6 52.4	6 32.5	25	1.1	85	3.9	145	6.6
26	6 36.5	6 37.6	6 18.4	26	1.1	86	3.8	146	6.4	26	6 51.5	6 52.6	6 32.8	26	1.2	86	3.9	146	6.7
27	6 36.8	6 37.8	6 18.7	27	1.2	87	3.8	147	6.5	27	6 51.8	6 52.9	6 33.0	27	1.2	87	4.0	147	6.7
28	6 37.0	6 38.1	6 18.9	28	1.2	88	3.9	148	6.5	28	6 52.0	6 53.1	6 33.2	28	1.3	88	4.0	148	6.8
29	6 37.3	6 38.3	6 19.2	29	1.3	89	3.9	149	6.6	29	6 52.3	6 53.4	6 33.5	29	1.3	89	4.1	149	6.8
30	6 37.5	6 38.6	6 19.4	30	1.3	90	4.0	150	6.6	30	6 52.5	6 53.6	6 33.7	30	1.4	90	4.1	150	6.9
31	6 37.8	6 38.8	6 19.6	31	1.4	91	4.0	151	6.7	31	6 52.8	6 53.9	6 33.9	31	1.4	91	4.2	151	6.9
32	6 38.0	6 39.1	6 19.9	32	1.4	92	4.1	152	6.7	32	6 53.0	6 54.1	6 34.2	32	1.5	92	4.2	152	7.0
33	6 38.3	6 39.3	6 20.1	33	1.5	93	4.1	153	6.8	33	6 53.3	6 54.4	6 34.4	33	1.5	93	4.3	153	7.0
34	6 38.5	6 39.6	6 20.3	34	1.5	94	4.2	154	6.8	34	6 53.5	6 54.6	6 34.7	34	1.6	94	4.3	154	7.1
35	6 38.8	6 39.8	6 20.6	35	1.5	95	4.2	155	6.8	35	6 53.8	6 54.9	6 34.9	35	1.6	95	4.4	155	7.1
36	6 39.0	6 40.1	6 20.8	36	1.6	96	4.2	156	6.9	36	6 54.0	6 55.1	6 35.1	36	1.7	96	4.4	156	7.2
37	6 39.3	6 40.3	6 21.1	37	1.6	97	4.3	157	6.9	37	6 54.3	6 55.4	6 35.4	37	1.7	97	4.4	157	7.2
38	6 39.5	6 40.6	6 21.3	38	1.7	98	4.3	158	7.0	38	6 54.5	6 55.6	6 35.6	38	1.7	98	4.5	158	7.2
39	6 39.8	6 40.8	6 21.5	39	1.7	99	4.4	159	7.0	39	6 54.8	6 55.9	6 35.9	39	1.8	99	4.5	159	7.3
40	6 40.0	6 41.1	6 21.8	40	1.8	100	4.4	160	7.1	40	6 55.0	6 56.1	6 36.1	40	1.8	100	4.6	160	7.3
41	6 40.3	6 41.3	6 22.0	41	1.8	101	4.5	161	7.1	41	6 55.3	6 56.4	6 36.3	41	1.9	101	4.6	161	7.4
42	6 40.5	6 41.6	6 22.3	42	1.9	102	4.5	162	7.2	42	6 55.5	6 56.6	6 36.6	42	1.9	102	4.7	162	7.4
43	6 40.8	6 41.8	6 22.5	43	1.9	103	4.5	163	7.2	43	6 55.8	6 56.9	6 36.8	43	2.0	103	4.7	163	7.5
44	6 41.0	6 42.1	6 22.7	44	1.9	104	4.6	164	7.2	44	6 56.0	6 57.1	6 37.0	44	2.0	104	4.8	164	7.5
45	6 41.3	6 42.3	6 23.0	45	2.0	105	4.6	165	7.3	45	6 56.3	6 57.4	6 37.3	45	2.1	105	4.8	165	7.6
46	6 41.5	6 42.6	6 23.2	46	2.0	106	4.7	166	7.3	46	6 56.5	6 57.6	6 37.5	46	2.1	106	4.9	166	7.6
47	6 41.8	6 42.8	6 23.4	47	2.1	107	4.7	167	7.4	47	6 56.8	6 57.9	6 37.8	47	2.2	107	4.9	167	7.7
48	6 42.0	6 43.1	6 23.7	48	2.1	108	4.8	168	7.4	48	6 57.0	6 58.1	6 38.0	48	2.2	108	5.0	168	7.7
49	6 42.3	6 43.4	6 23.9	49	2.2	109	4.8	169	7.5	49	6 57.3	6 58.4	6 38.2	49	2.2	109	5.0	169	7.7
50	6 42.5	6 43.6	6 24.2	50	2.2	110	4.9	170	7.5	50	6 57.5	6 58.6	6 38.5	50	2.3	110	5.0	170	7.8
51	6 42.8	6 43.9	6 24.4	51	2.3	111	4.9	171	7.6	51	6 57.8	6 58.9	6 38.7	51	2.3	111	5.1	171	7.8
52	6 43.0	6 44.1	6 24.6	52	2.3	112	4.9	172	7.6	52	6 58.0	6 59.1	6 39.0	52	2.4	112	5.1	172	7.9
53	6 43.3	6 44.4	6 24.9	53	2.3	113	5.0	173	7.6	53	6 58.3	6 59.4	6 39.2	53	2.4	113	5.2	173	7.9
54	6 43.5	6 44.6	6 25.1	54	2.4	114	5.0	174	7.7	54	6 58.5	6 59.6	6 39.4	54	2.5	114	5.2	174	8.0
55	6 43.8	6 44.9	6 25.4	55	2.4	115	5.1	175	7.7	55	6 58.8	6 59.9	6 39.7	55	2.5	115	5.3	175	8.0
56	6 44.0	6 45.1	6 25.6	56	2.5	116	5.1	176	7.8	56	6 59.0	7 00.1	6 39.9	56	2.6	116	5.3	176	8.1
57	6 44.3	6 45.4	6 25.8	57	2.5	117	5.2	177	7.8	57	6 59.3	7 00.4	6 40.2	57	2.6	117	5.4	177	8.1
58	6 44.5	6 45.6	6 26.1	58	2.6	118	5.2	178	7.9	58	6 59.5	7 00.6	6 40.4	58	2.7	118	5.4	178	8.2
59	6 44.8	6 45.9	6 26.3	59	2.6	119	5.3	179	7.9	59	6 59.8	7 00.9	6 40.6	59	2.7	119	5.5	179	8.2
60	6 45.0	6 46.1	6 26.6	60	2.7	120	5.3	180	8.0	60	7 00.0	7 01.1	6 40.9	60	2.8	120	5.5	180	8.3

Sec.	SUN PLANET	☿	MOON	code	corr'n	code	corr'n	code	corr'n	Sec.	SUN PLANET	☿	MOON	code	corr'n	code	corr'n	code	corr'n
0	7 00.0	7 01.1	6 40.9	0	0.0	60	2.9	120	5.7	0	7 15.0	7 16.2	6 55.2	0	0.0	60	3.0	120	5.9
1	7 00.3	7 01.4	6 41.1	1	0.0	61	2.9	121	5.7	1	7 15.3	7 16.4	6 55.4	1	0.0	61	3.0	121	5.9
2	7 00.5	7 01.7	6 41.3	2	0.1	62	2.9	122	5.8	2	7 15.5	7 16.7	6 55.7	2	0.1	62	3.0	122	6.0
3	7 00.8	7 01.9	6 41.6	3	0.1	63	3.0	123	5.8	3	7 15.8	7 16.9	6 55.9	3	0.1	63	3.1	123	6.0
4	7 01.0	7 02.2	6 41.8	4	0.2	64	3.0	124	5.9	4	7 16.0	7 17.2	6 56.1	4	0.2	64	3.1	124	6.1
5	7 01.3	7 02.4	6 42.1	5	0.2	65	3.1	125	5.9	5	7 16.3	7 17.4	6 56.4	5	0.2	65	3.2	125	6.1
6	7 01.5	7 02.7	6 42.3	6	0.3	66	3.1	126	6.0	6	7 16.5	7 17.7	6 56.6	6	0.3	66	3.2	126	6.2
7	7 01.8	7 02.9	6 42.5	7	0.3	67	3.2	127	6.0	7	7 16.8	7 17.9	6 56.9	7	0.3	67	3.3	127	6.2
8	7 02.0	7 03.2	6 42.8	8	0.4	68	3.2	128	6.1	8	7 17.0	7 18.2	6 57.1	8	0.4	68	3.3	128	6.3
9	7 02.3	7 03.4	6 43.0	9	0.4	69	3.3	129	6.1	9	7 17.3	7 18.4	6 57.3	9	0.4	69	3.4	129	6.3
10	7 02.5	7 03.7	6 43.3	10	0.5	70	3.3	130	6.2	10	7 17.5	7 18.7	6 57.6	10	0.5	70	3.4	130	6.4
11	7 02.8	7 03.9	6 43.5	11	0.5	71	3.4	131	6.2	11	7 17.8	7 18.9	6 57.8	11	0.5	71	3.5	131	6.4
12	7 03.0	7 04.2	6 43.7	12	0.6	72	3.4	132	6.3	12	7 18.0	7 19.2	6 58.0	12	0.6	72	3.5	132	6.5
13	7 03.3	7 04.4	6 44.0	13	0.6	73	3.5	133	6.3	13	7 18.3	7 19.4	6 58.3	13	0.6	73	3.6	133	6.5
14	7 03.5	7 04.7	6 44.2	14	0.7	74	3.5	134	6.4	14	7 18.5	7 19.7	6 58.5	14	0.7	74	3.6	134	6.6
15	7 03.8	7 04.9	6 44.4	15	0.7	75	3.6	135	6.4	15	7 18.8	7 20.0	6 58.8	15	0.7	75	3.7	135	6.6
16	7 04.0	7 05.2	6 44.7	16	0.8	76	3.6	136	6.5	16	7 19.0	7 20.2	6 59.0	16	0.8	76	3.7	136	6.7
17	7 04.3	7 05.4	6 44.9	17	0.8	77	3.7	137	6.5	17	7 19.3	7 20.5	6 59.2	17	0.8	77	3.8	137	6.7
18	7 04.5	7 05.7	6 45.2	18	0.9	78	3.7	138	6.6	18	7 19.5	7 20.7	6 59.5	18	0.9	78	3.8	138	6.8
19	7 04.8	7 05.9	6 45.4	19	0.9	79	3.8	139	6.6	19	7 19.8	7 21.0	6 59.7	19	0.9	79	3.9	139	6.8
20	7 05.0	7 06.2	6 45.6	20	1.0	80	3.8	140	6.7	20	7 20.0	7 21.2	7 00.0	20	1.0	80	3.9	140	6.9
21	7 05.3	7 06.4	6 45.9	21	1.0	81	3.8	141	6.7	21	7 20.3	7 21.5	7 00.2	21	1.0	81	4.0	141	6.9
22	7 05.5	7 06.7	6 46.1	22	1.0	82	3.9	142	6.7	22	7 20.5	7 21.7	7 00.4	22	1.1	82	4.0	142	7.0
23	7 05.8	7 06.9	6 46.4	23	1.1	83	3.9	143	6.8	23	7 20.8	7 22.0	7 00.7	23	1.1	83	4.1	143	7.0
24	7 06.0	7 07.2	6 46.6	24	1.1	84	4.0	144	6.8	24	7 21.0	7 22.2	7 00.9	24	1.2	84	4.1	144	7.1
25	7 06.3	7 07.4	6 46.8	25	1.2	85	4.0	145	6.9	25	7 21.3	7 22.5	7 01.1	25	1.2	85	4.2	145	7.1
26	7 06.5	7 07.7	6 47.1	26	1.2	86	4.1	146	6.9	26	7 21.5	7 22.7	7 01.4	26	1.3	86	4.2	146	7.2
27	7 06.8	7 07.9	6 47.3	27	1.3	87	4.1	147	7.0	27	7 21.8	7 23.0	7 01.6	27	1.3	87	4.3	147	7.2
28	7 07.0	7 08.2	6 47.5	28	1.3	88	4.2	148	7.0	28	7 22.0	7 23.2	7 01.9	28	1.4	88	4.3	148	7.3
29	7 07.3	7 08.4	6 47.8	29	1.4	89	4.2	149	7.1	29	7 22.3	7 23.5	7 02.1	29	1.4	89	4.4	149	7.3
30	7 07.5	7 08.7	6 48.0	30	1.4	90	4.3	150	7.1	30	7 22.5	7 23.7	7 02.3	30	1.5	90	4.4	150	7.4
31	7 07.8	7 08.9	6 48.3	31	1.5	91	4.3	151	7.2	31	7 22.8	7 24.0	7 02.6	31	1.5	91	4.5	151	7.4
32	7 08.0	7 09.2	6 48.5	32	1.5	92	4.4	152	7.2	32	7 23.0	7 24.2	7 02.8	32	1.6	92	4.5	152	7.5
33	7 08.3	7 09.4	6 48.7	33	1.6	93	4.4	153	7.3	33	7 23.3	7 24.5	7 03.1	33	1.6	93	4.6	153	7.5
34	7 08.5	7 09.7	6 49.0	34	1.6	94	4.5	154	7.3	34	7 23.5	7 24.7	7 03.3	34	1.7	94	4.6	154	7.6
35	7 08.8	7 09.9	6 49.2	35	1.7	95	4.5	155	7.4	35	7 23.8	7 25.0	7 03.5	35	1.7	95	4.7	155	7.6
36	7 09.0	7 10.2	6 49.5	36	1.7	96	4.6	156	7.4	36	7 24.0	7 25.2	7 03.8	36	1.8	96	4.7	156	7.7
37	7 09.3	7 10.4	6 49.7	37	1.8	97	4.6	157	7.5	37	7 24.3	7 25.5	7 04.0	37	1.8	97	4.8	157	7.7
38	7 09.5	7 10.7	6 49.9	38	1.8	98	4.7	158	7.5	38	7 24.5	7 25.7	7 04.3	38	1.9	98	4.8	158	7.8
39	7 09.8	7 10.9	6 50.2	39	1.9	99	4.7	159	7.6	39	7 24.8	7 26.0	7 04.5	39	1.9	99	4.9	159	7.8
40	7 10.0	7 11.2	6 50.4	40	1.9	100	4.8	160	7.6	40	7 25.0	7 26.2	7 04.7	40	2.0	100	4.9	160	7.9
41	7 10.3	7 11.4	6 50.6	41	1.9	101	4.8	161	7.6	41	7 25.3	7 26.5	7 05.0	41	2.0	101	5.0	161	7.9
42	7 10.5	7 11.7	6 50.9	42	2.0	102	4.8	162	7.7	42	7 25.5	7 26.7	7 05.2	42	2.1	102	5.0	162	8.0
43	7 10.8	7 11.9	6 51.1	43	2.0	103	4.9	163	7.7	43	7 25.8	7 27.0	7 05.4	43	2.1	103	5.1	163	8.0
44	7 11.0	7 12.2	6 51.4	44	2.1	104	4.9	164	7.8	44	7 26.0	7 27.2	7 05.7	44	2.2	104	5.1	164	8.1
45	7 11.3	7 12.4	6 51.6	45	2.1	105	5.0	165	7.8	45	7 26.3	7 27.5	7 05.9	45	2.2	105	5.2	165	8.1
46	7 11.5	7 12.7	6 51.8	46	2.2	106	5.0	166	7.9	46	7 26.5	7 27.7	7 06.2	46	2.3	106	5.2	166	8.2
47	7 11.8	7 12.9	6 52.1	47	2.2	107	5.1	167	7.9	47	7 26.8	7 28.0	7 06.4	47	2.3	107	5.3	167	8.2
48	7 12.0	7 13.2	6 52.3	48	2.3	108	5.1	168	8.0	48	7 27.0	7 28.2	7 06.6	48	2.4	108	5.3	168	8.3
49	7 12.3	7 13.4	6 52.6	49	2.3	109	5.2	169	8.0	49	7 27.3	7 28.5	7 06.9	49	2.4	109	5.4	169	8.3
50	7 12.5	7 13.7	6 52.8	50	2.4	110	5.2	170	8.1	50	7 27.5	7 28.7	7 07.1	50	2.5	110	5.4	170	8.4
51	7 12.8	7 13.9	6 53.0	51	2.4	111	5.3	171	8.1	51	7 27.8	7 29.0	7 07.4	51	2.5	111	5.5	171	8.4
52	7 13.0	7 14.2	6 53.3	52	2.5	112	5.3	172	8.2	52	7 28.0	7 29.2	7 07.6	52	2.6	112	5.5	172	8.5
53	7 13.3	7 14.4	6 53.5	53	2.5	113	5.4	173	8.2	53	7 28.3	7 29.5	7 07.8	53	2.6	113	5.6	173	8.5
54	7 13.5	7 14.7	6 53.8	54	2.6	114	5.4	174	8.3	54	7 28.5	7 29.7	7 08.1	54	2.7	114	5.6	174	8.6
55	7 13.8	7 14.9	6 54.0	55	2.6	115	5.5	175	8.3	55	7 28.8	7 30.0	7 08.3	55	2.7	115	5.7	175	8.6
56	7 14.0	7 15.2	6 54.2	56	2.7	116	5.5	176	8.4	56	7 29.0	7 30.2	7 08.5	56	2.8	116	5.7	176	8.7
57	7 14.3	7 15.4	6 54.5	57	2.7	117	5.6	177	8.4	57	7 29.3	7 30.5	7 08.8	57	2.8	117	5.8	177	8.7
58	7 14.5	7 15.7	6 54.7	58	2.8	118	5.6	178	8.5	58	7 29.5	7 30.7	7 09.0	58	2.9	118	5.8	178	8.8
59	7 14.8	7 15.9	6 54.9	59	2.8	119	5.7	179	8.5	59	7 29.8	7 31.0	7 09.3	59	2.9	119	5.9	179	8.8
60	7 15.0	7 16.2	6 55.2	60	2.9	120	5.7	180	8.6	60	7 30.0	7 31.2	7 09.5	60	3.0	120	5.9	180	8.9

Sec.	SUN PLANET	☿	MOON	code corr'n	code corr'n	code corr'n	Sec.	SUN PLANET	☿	MOON	code corr'n	code corr'n	code corr'n
0	7 30.0	7 31.2	7 09.5	0 0.0	60 3.1	120 6.1	0	7 45.0	7 46.3	7 23.8	0 0.0	60 3.2	120 6.3
1	7 30.3	7 31.5	7 09.7	1 0.1	61 3.1	121 6.2	1	7 45.3	7 46.5	7 24.1	1 0.1	61 3.2	121 6.4
2	7 30.5	7 31.7	7 10.0	2 0.1	62 3.2	122 6.2	2	7 45.5	7 46.8	7 24.3	2 0.1	62 3.3	122 6.4
3	7 30.8	7 32.0	7 10.2	3 0.2	63 3.2	123 6.3	3	7 45.8	7 47.0	7 24.5	3 0.2	63 3.3	123 6.5
4	7 31.0	7 32.2	7 10.5	4 0.2	64 3.3	124 6.3	4	7 46.0	7 47.3	7 24.8	4 0.2	64 3.4	124 6.5
5	7 31.3	7 32.5	7 10.7	5 0.3	65 3.3	125 6.4	5	7 46.3	7 47.5	7 25.0	5 0.3	65 3.4	125 6.6
6	7 31.5	7 32.7	7 10.9	6 0.3	66 3.4	126 6.4	6	7 46.5	7 47.8	7 25.2	6 0.3	66 3.5	126 6.6
7	7 31.8	7 33.0	7 11.2	7 0.4	67 3.4	127 6.5	7	7 46.8	7 48.0	7 25.5	7 0.4	67 3.5	127 6.7
8	7 32.0	7 33.2	7 11.4	8 0.4	68 3.5	128 6.5	8	7 47.0	7 48.3	7 25.7	8 0.4	68 3.6	128 6.7
9	7 32.3	7 33.5	7 11.6	9 0.5	69 3.5	129 6.6	9	7 47.3	7 48.5	7 26.0	9 0.5	69 3.6	129 6.8
10	7 32.5	7 33.7	7 11.9	10 0.5	70 3.6	130 6.6	10	7 47.5	7 48.8	7 26.2	10 0.5	70 3.7	130 6.8
11	7 32.8	7 34.0	7 12.1	11 0.6	71 3.6	131 6.7	11	7 47.8	7 49.0	7 26.4	11 0.6	71 3.7	131 6.9
12	7 33.0	7 34.2	7 12.4	12 0.6	72 3.7	132 6.7	12	7 48.0	7 49.3	7 26.7	12 0.6	72 3.8	132 6.9
13	7 33.3	7 34.5	7 12.6	13 0.7	73 3.7	133 6.8	13	7 48.3	7 49.5	7 26.9	13 0.7	73 3.8	133 7.0
14	7 33.5	7 34.7	7 12.8	14 0.7	74 3.8	134 6.8	14	7 48.5	7 49.8	7 27.2	14 0.7	74 3.9	134 7.0
15	7 33.8	7 35.0	7 13.1	15 0.8	75 3.8	135 6.9	15	7 48.8	7 50.0	7 27.4	15 0.8	75 3.9	135 7.1
16	7 34.0	7 35.2	7 13.3	16 0.8	76 3.9	136 6.9	16	7 49.0	7 50.3	7 27.6	16 0.8	76 4.0	136 7.1
17	7 34.3	7 35.5	7 13.6	17 0.9	77 3.9	137 7.0	17	7 49.3	7 50.5	7 27.9	17 0.9	77 4.0	137 7.2
18	7 34.5	7 35.7	7 13.8	18 0.9	78 4.0	138 7.0	18	7 49.5	7 50.8	7 28.1	18 0.9	78 4.1	138 7.2
19	7 34.8	7 36.0	7 14.0	19 1.0	79 4.0	139 7.1	19	7 49.8	7 51.0	7 28.4	19 1.0	79 4.1	139 7.3
20	7 35.0	7 36.2	7 14.3	20 1.0	80 4.1	140 7.1	20	7 50.0	7 51.3	7 28.6	20 1.1	80 4.2	140 7.4
21	7 35.3	7 36.5	7 14.5	21 1.1	81 4.1	141 7.2	21	7 50.3	7 51.5	7 28.8	21 1.1	81 4.3	141 7.4
22	7 35.5	7 36.7	7 14.7	22 1.1	82 4.2	142 7.2	22	7 50.5	7 51.8	7 29.1	22 1.2	82 4.3	142 7.5
23	7 35.8	7 37.0	7 15.0	23 1.2	83 4.2	143 7.3	23	7 50.8	7 52.0	7 29.3	23 1.2	83 4.4	143 7.5
24	7 36.0	7 37.2	7 15.2	24 1.2	84 4.3	144 7.3	24	7 51.0	7 52.3	7 29.5	24 1.3	84 4.4	144 7.6
25	7 36.3	7 37.5	7 15.5	25 1.3	85 4.3	145 7.4	25	7 51.3	7 52.5	7 29.8	25 1.3	85 4.5	145 7.6
26	7 36.5	7 37.7	7 15.7	26 1.3	86 4.4	146 7.4	26	7 51.5	7 52.8	7 30.0	26 1.4	86 4.5	146 7.7
27	7 36.8	7 38.0	7 15.9	27 1.4	87 4.4	147 7.5	27	7 51.8	7 53.0	7 30.3	27 1.4	87 4.6	147 7.7
28	7 37.0	7 38.3	7 16.2	28 1.4	88 4.5	148 7.5	28	7 52.0	7 53.3	7 30.5	28 1.5	88 4.6	148 7.8
29	7 37.3	7 38.5	7 16.4	29 1.5	89 4.5	149 7.6	29	7 52.3	7 53.5	7 30.7	29 1.5	89 4.7	149 7.8
30	7 37.5	7 38.8	7 16.7	30 1.5	90 4.6	150 7.6	30	7 52.5	7 53.8	7 31.0	30 1.6	90 4.7	150 7.9
31	7 37.8	7 39.0	7 16.9	31 1.6	91 4.6	151 7.7	31	7 52.8	7 54.0	7 31.2	31 1.6	91 4.8	151 7.9
32	7 38.0	7 39.3	7 17.1	32 1.6	92 4.7	152 7.7	32	7 53.0	7 54.3	7 31.5	32 1.7	92 4.8	152 8.0
33	7 38.3	7 39.5	7 17.4	33 1.7	93 4.7	153 7.8	33	7 53.3	7 54.5	7 31.7	33 1.7	93 4.9	153 8.0
34	7 38.5	7 39.8	7 17.6	34 1.7	94 4.8	154 7.8	34	7 53.5	7 54.8	7 31.9	34 1.8	94 4.9	154 8.1
35	7 38.8	7 40.0	7 17.9	35 1.8	95 4.8	155 7.9	35	7 53.8	7 55.0	7 32.2	35 1.8	95 5.0	155 8.1
36	7 39.0	7 40.3	7 18.1	36 1.8	96 4.9	156 7.9	36	7 54.0	7 55.3	7 32.4	36 1.9	96 5.0	156 8.2
37	7 39.3	7 40.5	7 18.3	37 1.9	97 4.9	157 8.0	37	7 54.3	7 55.5	7 32.6	37 1.9	97 5.1	157 8.2
38	7 39.5	7 40.8	7 18.6	38 1.9	98 5.0	158 8.0	38	7 54.5	7 55.8	7 32.9	38 2.0	98 5.1	158 8.3
39	7 39.8	7 41.0	7 18.8	39 2.0	99 5.0	159 8.1	39	7 54.8	7 56.0	7 33.1	39 2.0	99 5.2	159 8.3
40	7 40.0	7 41.3	7 19.0	40 2.0	100 5.1	160 8.1	40	7 55.0	7 56.3	7 33.4	40 2.1	100 5.3	160 8.4
41	7 40.3	7 41.5	7 19.3	41 2.1	101 5.1	161 8.2	41	7 55.3	7 56.6	7 33.6	41 2.2	101 5.3	161 8.5
42	7 40.5	7 41.8	7 19.5	42 2.1	102 5.2	162 8.2	42	7 55.5	7 56.8	7 33.8	42 2.2	102 5.4	162 8.5
43	7 40.8	7 42.0	7 19.8	43 2.2	103 5.2	163 8.3	43	7 55.8	7 57.1	7 34.1	43 2.3	103 5.4	163 8.6
44	7 41.0	7 42.3	7 20.0	44 2.2	104 5.3	164 8.3	44	7 56.0	7 57.3	7 34.3	44 2.3	104 5.5	164 8.6
45	7 41.3	7 42.5	7 20.2	45 2.3	105 5.3	165 8.4	45	7 56.3	7 57.6	7 34.6	45 2.4	105 5.5	165 8.7
46	7 41.5	7 42.8	7 20.5	46 2.3	106 5.4	166 8.4	46	7 56.5	7 57.8	7 34.8	46 2.4	106 5.6	166 8.7
47	7 41.8	7 43.0	7 20.7	47 2.4	107 5.4	167 8.5	47	7 56.8	7 58.1	7 35.0	47 2.5	107 5.6	167 8.8
48	7 42.0	7 43.3	7 21.0	48 2.4	108 5.5	168 8.5	48	7 57.0	7 58.3	7 35.3	48 2.5	108 5.7	168 8.8
49	7 42.3	7 43.5	7 21.2	49 2.5	109 5.5	169 8.6	49	7 57.3	7 58.6	7 35.5	49 2.6	109 5.7	169 8.9
50	7 42.5	7 43.8	7 21.4	50 2.5	110 5.6	170 8.6	50	7 57.5	7 58.8	7 35.7	50 2.6	110 5.8	170 8.9
51	7 42.8	7 44.0	7 21.7	51 2.6	111 5.6	171 8.7	51	7 57.8	7 59.1	7 36.0	51 2.7	111 5.8	171 9.0
52	7 43.0	7 44.3	7 21.9	52 2.6	112 5.7	172 8.7	52	7 58.0	7 59.3	7 36.2	52 2.7	112 5.9	172 9.0
53	7 43.3	7 44.5	7 22.1	53 2.7	113 5.7	173 8.8	53	7 58.3	7 59.6	7 36.5	53 2.8	113 5.9	173 9.1
54	7 43.5	7 44.8	7 22.4	54 2.7	114 5.8	174 8.8	54	7 58.5	7 59.8	7 36.7	54 2.8	114 6.0	174 9.1
55	7 43.8	7 45.0	7 22.6	55 2.8	115 5.8	175 8.9	55	7 58.8	8 00.1	7 36.9	55 2.9	115 6.0	175 9.2
56	7 44.0	7 45.3	7 22.9	56 2.8	116 5.9	176 8.9	56	7 59.0	8 00.3	7 37.2	56 2.9	116 6.1	176 9.2
57	7 44.3	7 45.5	7 23.1	57 2.9	117 5.9	177 9.0	57	7 59.3	8 00.6	7 37.4	57 3.0	117 6.1	177 9.3
58	7 44.5	7 45.8	7 23.3	58 2.9	118 6.0	178 9.0	58	7 59.5	8 00.8	7 37.7	58 3.0	118 6.2	178 9.3
59	7 44.8	7 46.0	7 23.6	59 3.0	119 6.0	179 9.1	59	7 59.8	8 01.1	7 37.9	59 3.1	119 6.2	179 9.4
60	7 45.0	7 46.3	7 23.8	60 3.1	120 6.1	180 9.2	60	8 00.0	8 01.3	7 38.1	60 3.2	120 6.3	180 9.5

Sec.	SUN PLANET	☿	MOON	code	corr'n	code	corr'n	code	corr'n	Sec.	SUN PLANET	☿	MOON	code	corr'n	code	corr'n	code	corr'n
0	8 00.0	8 01.3	7 38.1	0 0.0	60 3.3	120 6.5		0	8 15.0	8 16.4	7 52.5	0 0.0	60 3.4	120 6.7		0	8 15.0	8 16.4	7 52.5
1	8 00.3	8 01.6	7 38.4	1 0.1	61 3.3	121 6.6		1	8 15.3	8 16.6	7 52.7	1 0.1	61 3.4	121 6.8		1	8 15.3	8 16.6	7 52.7
2	8 00.5	8 01.8	7 38.6	2 0.1	62 3.4	122 6.6		2	8 15.5	8 16.9	7 52.9	2 0.1	62 3.5	122 6.8		2	8 15.5	8 16.9	7 52.9
3	8 00.8	8 02.1	7 38.8	3 0.2	63 3.4	123 6.7		3	8 15.8	8 17.1	7 53.2	3 0.2	63 3.5	123 6.9		3	8 15.8	8 17.1	7 53.2
4	8 01.0	8 02.3	7 39.1	4 0.2	64 3.5	124 6.7		4	8 16.0	8 17.4	7 53.4	4 0.2	64 3.6	124 6.9		4	8 16.0	8 17.4	7 53.4
5	8 01.3	8 02.6	7 39.3	5 0.3	65 3.5	125 6.8		5	8 16.3	8 17.6	7 53.6	5 0.3	65 3.6	125 7.0		5	8 16.3	8 17.6	7 53.6
6	8 01.5	8 02.8	7 39.6	6 0.3	66 3.6	126 6.8		6	8 16.5	8 17.9	7 53.9	6 0.3	66 3.7	126 7.0		6	8 16.5	8 17.9	7 53.9
7	8 01.8	8 03.1	7 39.8	7 0.4	67 3.6	127 6.9		7	8 16.8	8 18.1	7 54.1	7 0.4	67 3.7	127 7.1		7	8 16.8	8 18.1	7 54.1
8	8 02.0	8 03.3	7 40.0	8 0.4	68 3.7	128 6.9		8	8 17.0	8 18.4	7 54.4	8 0.4	68 3.8	128 7.1		8	8 17.0	8 18.4	7 54.4
9	8 02.3	8 03.6	7 40.3	9 0.5	69 3.7	129 7.0		9	8 17.3	8 18.6	7 54.6	9 0.5	69 3.9	129 7.2		9	8 17.3	8 18.6	7 54.6
10	8 02.5	8 03.8	7 40.5	10 0.5	70 3.8	130 7.0		10	8 17.5	8 18.9	7 54.8	10 0.6	70 3.9	130 7.3		10	8 17.5	8 18.9	7 54.8
11	8 02.8	8 04.1	7 40.8	11 0.6	71 3.8	131 7.1		11	8 17.8	8 19.1	7 55.1	11 0.6	71 4.0	131 7.3		11	8 17.8	8 19.1	7 55.1
12	8 03.0	8 04.3	7 41.0	12 0.7	72 3.9	132 7.2		12	8 18.0	8 19.4	7 55.3	12 0.7	72 4.0	132 7.4		12	8 18.0	8 19.4	7 55.3
13	8 03.3	8 04.6	7 41.2	13 0.7	73 4.0	133 7.2		13	8 18.3	8 19.6	7 55.6	13 0.7	73 4.1	133 7.4		13	8 18.3	8 19.6	7 55.6
14	8 03.5	8 04.8	7 41.5	14 0.8	74 4.0	134 7.3		14	8 18.5	8 19.9	7 55.8	14 0.8	74 4.1	134 7.5		14	8 18.5	8 19.9	7 55.8
15	8 03.8	8 05.1	7 41.7	15 0.8	75 4.1	135 7.3		15	8 18.8	8 20.1	7 56.0	15 0.8	75 4.2	135 7.5		15	8 18.8	8 20.1	7 56.0
16	8 04.0	8 05.3	7 42.0	16 0.9	76 4.1	136 7.4		16	8 19.0	8 20.4	7 56.3	16 0.9	76 4.2	136 7.6		16	8 19.0	8 20.4	7 56.3
17	8 04.3	8 05.6	7 42.2	17 0.9	77 4.2	137 7.4		17	8 19.3	8 20.6	7 56.5	17 0.9	77 4.3	137 7.6		17	8 19.3	8 20.6	7 56.5
18	8 04.5	8 05.8	7 42.4	18 1.0	78 4.2	138 7.5		18	8 19.5	8 20.9	7 56.7	18 1.0	78 4.4	138 7.7		18	8 19.5	8 20.9	7 56.7
19	8 04.8	8 06.1	7 42.7	19 1.0	79 4.3	139 7.5		19	8 19.8	8 21.1	7 57.0	19 1.1	79 4.4	139 7.8		19	8 19.8	8 21.1	7 57.0
20	8 05.0	8 06.3	7 42.9	20 1.1	80 4.3	140 7.6		20	8 20.0	8 21.4	7 57.2	20 1.1	80 4.5	140 7.8		20	8 20.0	8 21.4	7 57.2
21	8 05.3	8 06.6	7 43.1	21 1.1	81 4.4	141 7.6		21	8 20.3	8 21.6	7 57.5	21 1.2	81 4.5	141 7.9		21	8 20.3	8 21.6	7 57.5
22	8 05.5	8 06.8	7 43.4	22 1.2	82 4.4	142 7.7		22	8 20.5	8 21.9	7 57.7	22 1.2	82 4.6	142 7.9		22	8 20.5	8 21.9	7 57.7
23	8 05.8	8 07.1	7 43.6	23 1.2	83 4.5	143 7.7		23	8 20.8	8 22.1	7 57.9	23 1.3	83 4.6	143 8.0		23	8 20.8	8 22.1	7 57.9
24	8 06.0	8 07.3	7 43.9	24 1.3	84 4.6	144 7.8		24	8 21.0	8 22.4	7 58.2	24 1.3	84 4.7	144 8.0		24	8 21.0	8 22.4	7 58.2
25	8 06.3	8 07.6	7 44.1	25 1.4	85 4.6	145 7.9		25	8 21.3	8 22.6	7 58.4	25 1.4	85 4.7	145 8.1		25	8 21.3	8 22.6	7 58.4
26	8 06.5	8 07.8	7 44.3	26 1.4	86 4.7	146 7.9		26	8 21.5	8 22.9	7 58.7	26 1.5	86 4.8	146 8.2		26	8 21.5	8 22.9	7 58.7
27	8 06.8	8 08.1	7 44.6	27 1.5	87 4.7	147 8.0		27	8 21.8	8 23.1	7 58.9	27 1.5	87 4.9	147 8.2		27	8 21.8	8 23.1	7 58.9
28	8 07.0	8 08.3	7 44.8	28 1.5	88 4.8	148 8.0		28	8 22.0	8 23.4	7 59.1	28 1.6	88 4.9	148 8.3		28	8 22.0	8 23.4	7 59.1
29	8 07.3	8 08.6	7 45.1	29 1.6	89 4.8	149 8.1		29	8 22.3	8 23.6	7 59.4	29 1.6	89 5.0	149 8.3		29	8 22.3	8 23.6	7 59.4
30	8 07.5	8 08.8	7 45.3	30 1.6	90 4.9	150 8.1		30	8 22.5	8 23.9	7 59.6	30 1.7	90 5.0	150 8.4		30	8 22.5	8 23.9	7 59.6
31	8 07.8	8 09.1	7 45.5	31 1.7	91 4.9	151 8.2		31	8 22.8	8 24.1	7 59.8	31 1.7	91 5.1	151 8.4		31	8 22.8	8 24.1	7 59.8
32	8 08.0	8 09.3	7 45.8	32 1.7	92 5.0	152 8.2		32	8 23.0	8 24.4	8 00.1	32 1.8	92 5.1	152 8.5		32	8 23.0	8 24.4	8 00.1
33	8 08.3	8 09.6	7 46.0	33 1.8	93 5.0	153 8.3		33	8 23.3	8 24.6	8 00.3	33 1.8	93 5.2	153 8.5		33	8 23.3	8 24.6	8 00.3
34	8 08.5	8 09.8	7 46.2	34 1.8	94 5.1	154 8.3		34	8 23.5	8 24.9	8 00.6	34 1.9	94 5.2	154 8.6		34	8 23.5	8 24.9	8 00.6
35	8 08.8	8 10.1	7 46.5	35 1.9	95 5.1	155 8.4		35	8 23.8	8 25.1	8 00.8	35 2.0	95 5.3	155 8.7		35	8 23.8	8 25.1	8 00.8
36	8 09.0	8 10.3	7 46.7	36 2.0	96 5.2	156 8.5		36	8 24.0	8 25.4	8 01.0	36 2.0	96 5.4	156 8.7		36	8 24.0	8 25.4	8 01.0
37	8 09.3	8 10.6	7 47.0	37 2.0	97 5.3	157 8.5		37	8 24.3	8 25.6	8 01.3	37 2.1	97 5.4	157 8.8		37	8 24.3	8 25.6	8 01.3
38	8 09.5	8 10.8	7 47.2	38 2.1	98 5.3	158 8.6		38	8 24.5	8 25.9	8 01.5	38 2.1	98 5.5	158 8.8		38	8 24.5	8 25.9	8 01.5
39	8 09.8	8 11.1	7 47.4	39 2.1	99 5.4	159 8.6		39	8 24.8	8 26.1	8 01.8	39 2.2	99 5.5	159 8.9		39	8 24.8	8 26.1	8 01.8
40	8 10.0	8 11.3	7 47.7	40 2.2	100 5.4	160 8.7		40	8 25.0	8 26.4	8 02.0	40 2.2	100 5.6	160 8.9		40	8 25.0	8 26.4	8 02.0
41	8 10.3	8 11.6	7 47.9	41 2.2	101 5.5	161 8.7		41	8 25.3	8 26.6	8 02.2	41 2.3	101 5.6	161 9.0		41	8 25.3	8 26.6	8 02.2
42	8 10.5	8 11.8	7 48.2	42 2.3	102 5.5	162 8.8		42	8 25.5	8 26.9	8 02.5	42 2.3	102 5.7	162 9.0		42	8 25.5	8 26.9	8 02.5
43	8 10.8	8 12.1	7 48.4	43 2.3	103 5.6	163 8.8		43	8 25.8	8 27.1	8 02.7	43 2.4	103 5.8	163 9.1		43	8 25.8	8 27.1	8 02.7
44	8 11.0	8 12.3	7 48.6	44 2.4	104 5.6	164 8.9		44	8 26.0	8 27.4	8 02.9	44 2.5	104 5.8	164 9.2		44	8 26.0	8 27.4	8 02.9
45	8 11.3	8 12.6	7 48.9	45 2.4	105 5.7	165 8.9		45	8 26.3	8 27.6	8 03.2	45 2.5	105 5.9	165 9.2		45	8 26.3	8 27.6	8 03.2
46	8 11.5	8 12.8	7 49.1	46 2.5	106 5.7	166 9.0		46	8 26.5	8 27.9	8 03.4	46 2.6	106 5.9	166 9.3		46	8 26.5	8 27.9	8 03.4
47	8 11.8	8 13.1	7 49.3	47 2.5	107 5.8	167 9.0		47	8 26.8	8 28.1	8 03.7	47 2.6	107 6.0	167 9.3		47	8 26.8	8 28.1	8 03.7
48	8 12.0	8 13.3	7 49.6	48 2.6	108 5.9	168 9.1		48	8 27.0	8 28.4	8 03.9	48 2.7	108 6.0	168 9.4		48	8 27.0	8 28.4	8 03.9
49	8 12.3	8 13.6	7 49.8	49 2.7	109 5.9	169 9.2		49	8 27.3	8 28.6	8 04.1	49 2.7	109 6.1	169 9.4		49	8 27.3	8 28.6	8 04.1
50	8 12.5	8 13.8	7 50.1	50 2.7	110 6.0	170 9.2		50	8 27.5	8 28.9	8 04.4	50 2.8	110 6.1	170 9.5		50	8 27.5	8 28.9	8 04.4
51	8 12.8	8 14.1	7 50.3	51 2.8	111 6.0	171 9.3		51	8 27.8	8 29.1	8 04.6	51 2.8	111 6.2	171 9.5		51	8 27.8	8 29.1	8 04.6
52	8 13.0	8 14.3	7 50.5	52 2.8	112 6.1	172 9.3		52	8 28.0	8 29.4	8 04.9	52 2.9	112 6.3	172 9.6		52	8 28.0	8 29.4	8 04.9
53	8 13.3	8 14.6	7 50.8	53 2.9	113 6.1	173 9.4		53	8 28.3	8 29.6	8 05.1	53 3.0	113 6.3	173 9.7		53	8 28.3	8 29.6	8 05.1
54	8 13.5	8 14.9	7 51.0	54 2.9	114 6.2	174 9.4		54	8 28.5	8 29.9	8 05.3	54 3.0	114 6.4	174 9.7		54	8 28.5	8 29.9	8 05.3
55	8 13.8	8 15.1	7 51.3	55 3.0	115 6.2	175 9.5		55	8 28.8	8 30.1	8 05.6	55 3.1	115 6.4	175 9.8		55	8 28.8	8 30.1	8 05.6
56	8 14.0	8 15.4	7 51.5	56 3.0	116 6.3	176 9.5		56	8 29.0	8 30.4	8 05.8	56 3.1	116 6.5	176 9.8		56	8 29.0	8 30.4	8 05.8
57	8 14.3	8 15.6	7 51.7	57 3.1	117 6.3	177 9.6		57	8 29.3	8 30.6	8 06.1	57 3.2	117 6.5	177 9.9		57	8 29.3	8 30.6	8 06.1
58	8 14.5	8 15.9	7 52.0	58 3.1	118 6.4	178 9.6		58	8 29.5	8 30.9	8 06.3	58 3.2	118 6.6	178 9.9		58	8 29.5	8 30.9	8 06.3
59	8 14.8	8 16.1	7 52.2	59 3.2	119 6.4	179 9.7		59	8 29.8	8 31.1	8 06.5	59 3.3	119 6.6	179 10.0		59	8 29.8	8 31.1	8 06.5

Sec.	SUN PLANET	☿	MOON	code corr'n	code corr'n	code corr'n	Sec.	SUN PLANET	☿	MOON	code corr'n	code corr'n	code corr'n
0	8 30.0	8 31.4	8 06.8	0 0.0	60 3.5	120 6.9	0	8 45.0	8 46.4	8 21.1	0 0.0	60 3.6	120 7.1
1	8 30.3	8 31.6	8 07.0	1 0.1	61 3.5	121 7.0	1	8 45.3	8 46.7	8 21.3	1 0.1	61 3.6	121 7.2
2	8 30.5	8 31.9	8 07.2	2 0.1	62 3.6	122 7.0	2	8 45.5	8 46.9	8 21.6	2 0.1	62 3.7	122 7.2
3	8 30.8	8 32.1	8 07.5	3 0.2	63 3.6	123 7.1	3	8 45.8	8 47.2	8 21.8	3 0.2	63 3.7	123 7.3
4	8 31.0	8 32.4	8 07.7	4 0.2	64 3.7	124 7.1	4	8 46.0	8 47.4	8 22.0	4 0.2	64 3.8	124 7.3
5	8 31.3	8 32.6	8 08.0	5 0.3	65 3.7	125 7.2	5	8 46.3	8 47.7	8 22.3	5 0.3	65 3.8	125 7.4
6	8 31.5	8 32.9	8 08.2	6 0.3	66 3.8	126 7.2	6	8 46.5	8 47.9	8 22.5	6 0.4	66 3.9	126 7.5
7	8 31.8	8 33.2	8 08.4	7 0.4	67 3.9	127 7.3	7	8 46.8	8 48.2	8 22.8	7 0.4	67 4.0	127 7.5
8	8 32.0	8 33.4	8 08.7	8 0.5	68 3.9	128 7.4	8	8 47.0	8 48.4	8 23.0	8 0.5	68 4.0	128 7.6
9	8 32.3	8 33.7	8 08.9	9 0.5	69 4.0	129 7.4	9	8 47.3	8 48.7	8 23.2	9 0.5	69 4.1	129 7.6
10	8 32.5	8 33.9	8 09.2	10 0.6	70 4.0	130 7.5	10	8 47.5	8 48.9	8 23.5	10 0.6	70 4.1	130 7.7
11	8 32.8	8 34.2	8 09.4	11 0.6	71 4.1	131 7.5	11	8 47.8	8 49.2	8 23.7	11 0.7	71 4.2	131 7.8
12	8 33.0	8 34.4	8 09.6	12 0.7	72 4.1	132 7.6	12	8 48.0	8 49.4	8 23.9	12 0.7	72 4.3	132 7.8
13	8 33.3	8 34.7	8 09.9	13 0.7	73 4.2	133 7.6	13	8 48.3	8 49.7	8 24.2	13 0.8	73 4.3	133 7.9
14	8 33.5	8 34.9	8 10.1	14 0.8	74 4.3	134 7.7	14	8 48.5	8 49.9	8 24.4	14 0.8	74 4.4	134 7.9
15	8 33.8	8 35.2	8 10.3	15 0.9	75 4.3	135 7.8	15	8 48.8	8 50.2	8 24.7	15 0.9	75 4.4	135 8.0
16	8 34.0	8 35.4	8 10.6	16 0.9	76 4.4	136 7.8	16	8 49.0	8 50.4	8 24.9	16 0.9	76 4.5	136 8.0
17	8 34.3	8 35.7	8 10.8	17 1.0	77 4.4	137 7.9	17	8 49.3	8 50.7	8 25.1	17 1.0	77 4.6	137 8.1
18	8 34.5	8 35.9	8 11.1	18 1.0	78 4.5	138 7.9	18	8 49.5	8 50.9	8 25.4	18 1.1	78 4.6	138 8.2
19	8 34.8	8 36.2	8 11.3	19 1.1	79 4.5	139 8.0	19	8 49.8	8 51.2	8 25.6	19 1.1	79 4.7	139 8.2
20	8 35.0	8 36.4	8 11.5	20 1.2	80 4.6	140 8.1	20	8 50.0	8 51.5	8 25.9	20 1.2	80 4.7	140 8.3
21	8 35.3	8 36.7	8 11.8	21 1.2	81 4.7	141 8.1	21	8 50.3	8 51.7	8 26.1	21 1.2	81 4.8	141 8.3
22	8 35.5	8 36.9	8 12.0	22 1.3	82 4.7	142 8.2	22	8 50.5	8 52.0	8 26.3	22 1.3	82 4.9	142 8.4
23	8 35.8	8 37.2	8 12.3	23 1.3	83 4.8	143 8.2	23	8 50.8	8 52.2	8 26.6	23 1.4	83 4.9	143 8.5
24	8 36.0	8 37.4	8 12.5	24 1.4	84 4.8	144 8.3	24	8 51.0	8 52.5	8 26.8	24 1.4	84 5.0	144 8.5
25	8 36.3	8 37.7	8 12.7	25 1.4	85 4.9	145 8.3	25	8 51.3	8 52.7	8 27.0	25 1.5	85 5.0	145 8.6
26	8 36.5	8 37.9	8 13.0	26 1.5	86 4.9	146 8.4	26	8 51.5	8 53.0	8 27.3	26 1.5	86 5.1	146 8.6
27	8 36.8	8 38.2	8 13.2	27 1.6	87 5.0	147 8.5	27	8 51.8	8 53.2	8 27.5	27 1.6	87 5.1	147 8.7
28	8 37.0	8 38.4	8 13.4	28 1.6	88 5.1	148 8.5	28	8 52.0	8 53.5	8 27.8	28 1.7	88 5.2	148 8.8
29	8 37.3	8 38.7	8 13.7	29 1.7	89 5.1	149 8.6	29	8 52.3	8 53.7	8 28.0	29 1.7	89 5.3	149 8.8
30	8 37.5	8 38.9	8 13.9	30 1.7	90 5.2	150 8.6	30	8 52.5	8 54.0	8 28.2	30 1.8	90 5.3	150 8.9
31	8 37.8	8 39.2	8 14.2	31 1.8	91 5.2	151 8.7	31	8 52.8	8 54.2	8 28.5	31 1.8	91 5.4	151 8.9
32	8 38.0	8 39.4	8 14.4	32 1.8	92 5.3	152 8.7	32	8 53.0	8 54.5	8 28.7	32 1.9	92 5.4	152 9.0
33	8 38.3	8 39.7	8 14.6	33 1.9	93 5.3	153 8.8	33	8 53.3	8 54.7	8 29.0	33 2.0	93 5.5	153 9.1
34	8 38.5	8 39.9	8 14.9	34 2.0	94 5.4	154 8.9	34	8 53.5	8 55.0	8 29.2	34 2.0	94 5.6	154 9.1
35	8 38.8	8 40.2	8 15.1	35 2.0	95 5.5	155 8.9	35	8 53.8	8 55.2	8 29.4	35 2.1	95 5.6	155 9.2
36	8 39.0	8 40.4	8 15.4	36 2.1	96 5.5	156 9.0	36	8 54.0	8 55.5	8 29.7	36 2.1	96 5.7	156 9.2
37	8 39.3	8 40.7	8 15.6	37 2.1	97 5.6	157 9.0	37	8 54.3	8 55.7	8 29.9	37 2.2	97 5.7	157 9.3
38	8 39.5	8 40.9	8 15.8	38 2.2	98 5.6	158 9.1	38	8 54.5	8 56.0	8 30.2	38 2.2	98 5.8	158 9.3
39	8 39.8	8 41.2	8 16.1	39 2.2	99 5.7	159 9.1	39	8 54.8	8 56.2	8 30.4	39 2.3	99 5.9	159 9.4
40	8 40.0	8 41.4	8 16.3	40 2.3	100 5.8	160 9.2	40	8 55.0	8 56.5	8 30.6	40 2.4	100 5.9	160 9.5
41	8 40.3	8 41.7	8 16.5	41 2.4	101 5.8	161 9.3	41	8 55.3	8 56.7	8 30.9	41 2.4	101 6.0	161 9.5
42	8 40.5	8 41.9	8 16.8	42 2.4	102 5.9	162 9.3	42	8 55.5	8 57.0	8 31.1	42 2.5	102 6.0	162 9.6
43	8 40.8	8 42.2	8 17.0	43 2.5	103 5.9	163 9.4	43	8 55.8	8 57.2	8 31.3	43 2.5	103 6.1	163 9.6
44	8 41.0	8 42.4	8 17.3	44 2.5	104 6.0	164 9.4	44	8 56.0	8 57.5	8 31.6	44 2.6	104 6.2	164 9.7
45	8 41.3	8 42.7	8 17.5	45 2.6	105 6.0	165 9.5	45	8 56.3	8 57.7	8 31.8	45 2.7	105 6.2	165 9.8
46	8 41.5	8 42.9	8 17.7	46 2.6	106 6.1	166 9.5	46	8 56.5	8 58.0	8 32.1	46 2.7	106 6.3	166 9.8
47	8 41.8	8 43.2	8 18.0	47 2.7	107 6.2	167 9.6	47	8 56.8	8 58.2	8 32.3	47 2.8	107 6.3	167 9.9
48	8 42.0	8 43.4	8 18.2	48 2.8	108 6.2	168 9.7	48	8 57.0	8 58.5	8 32.5	48 2.8	108 6.4	168 9.9
49	8 42.3	8 43.7	8 18.5	49 2.8	109 6.3	169 9.7	49	8 57.3	8 58.7	8 32.8	49 2.9	109 6.4	169 10.0
50	8 42.5	8 43.9	8 18.7	50 2.9	110 6.3	170 9.8	50	8 57.5	8 59.0	8 33.0	50 3.0	110 6.5	170 10.1
51	8 42.8	8 44.2	8 18.9	51 2.9	111 6.4	171 9.8	51	8 57.8	8 59.2	8 33.3	51 3.0	111 6.6	171 10.1
52	8 43.0	8 44.4	8 19.2	52 3.0	112 6.4	172 9.9	52	8 58.0	8 59.5	8 33.5	52 3.1	112 6.6	172 10.2
53	8 43.3	8 44.7	8 19.4	53 3.0	113 6.5	173 9.9	53	8 58.3	8 59.7	8 33.7	53 3.1	113 6.7	173 10.2
54	8 43.5	8 44.9	8 19.7	54 3.1	114 6.6	174 10.0	54	8 58.5	9 00.0	8 34.0	54 3.2	114 6.7	174 10.3
55	8 43.8	8 45.2	8 19.9	55 3.2	115 6.6	175 10.1	55	8 58.8	9 00.2	8 34.2	55 3.3	115 6.8	175 10.4
56	8 44.0	8 45.4	8 20.1	56 3.2	116 6.7	176 10.1	56	8 59.0	9 00.5	8 34.4	56 3.3	116 6.9	176 10.4
57	8 44.3	8 45.7	8 20.4	57 3.3	117 6.7	177 10.2	57	8 59.3	9 00.7	8 34.7	57 3.4	117 6.9	177 10.5
58	8 44.5	8 45.9	8 20.6	58 3.3	118 6.8	178 10.2	58	8 59.5	9 01.0	8 34.9	58 3.4	118 7.0	178 10.5
59	8 44.8	8 46.2	8 20.8	59 3.4	119 6.8	179 10.3	59	8 59.8	9 01.2	8 35.2	59 3.5	119 7.0	179 10.6
60	8 45.0	8 46.4	8 21.1	60 3.5	120 6.9	180 10.4	60	9 00.0	9 01.5	8 35.4	60 3.6	120 7.1	180 10.7

Sec.	SUN PLANET	☿	MOON	code	corr'n	code	corr'n	code	corr'n
0	☿ 00.0	☿ 01.5	☿ 35.4	0	0.0	60	3.7	120	7.3
1	☿ 00.3	☿ 01.7	☿ 35.6	1	0.1	61	3.7	121	7.4
2	☿ 00.5	☿ 02.0	☿ 35.9	2	0.1	62	3.8	122	7.4
3	☿ 00.8	☿ 02.2	☿ 36.1	3	0.2	63	3.8	123	7.5
4	☿ 01.0	☿ 02.5	☿ 36.4	4	0.2	64	3.9	124	7.5
5	☿ 01.3	☿ 02.7	☿ 36.6	5	0.3	65	4.0	125	7.6
6	☿ 01.5	☿ 03.0	☿ 36.8	6	0.4	66	4.0	126	7.7
7	☿ 01.8	☿ 03.2	☿ 37.1	7	0.4	67	4.1	127	7.7
8	☿ 02.0	☿ 03.5	☿ 37.3	8	0.5	68	4.1	128	7.8
9	☿ 02.3	☿ 03.7	☿ 37.5	9	0.5	69	4.2	129	7.8
10	☿ 02.5	☿ 04.0	☿ 37.8	10	0.6	70	4.3	130	7.9
11	☿ 02.8	☿ 04.2	☿ 38.0	11	0.7	71	4.3	131	8.0
12	☿ 03.0	☿ 04.5	☿ 38.3	12	0.7	72	4.4	132	8.0
13	☿ 03.3	☿ 04.7	☿ 38.5	13	0.8	73	4.4	133	8.1
14	☿ 03.5	☿ 05.0	☿ 38.7	14	0.9	74	4.5	134	8.2
15	☿ 03.8	☿ 05.2	☿ 39.0	15	0.9	75	4.6	135	8.2
16	☿ 04.0	☿ 05.5	☿ 39.2	16	1.0	76	4.6	136	8.3
17	☿ 04.3	☿ 05.7	☿ 39.5	17	1.0	77	4.7	137	8.3
18	☿ 04.5	☿ 06.0	☿ 39.7	18	1.1	78	4.7	138	8.4
19	☿ 04.8	☿ 06.2	☿ 39.9	19	1.2	79	4.8	139	8.5
20	☿ 05.0	☿ 06.5	☿ 40.2	20	1.2	80	4.9	140	8.5
21	☿ 05.3	☿ 06.7	☿ 40.4	21	1.3	81	4.9	141	8.6
22	☿ 05.5	☿ 07.0	☿ 40.6	22	1.3	82	5.0	142	8.6
23	☿ 05.8	☿ 07.2	☿ 40.9	23	1.4	83	5.0	143	8.7
24	☿ 06.0	☿ 07.5	☿ 41.1	24	1.5	84	5.1	144	8.8
25	☿ 06.3	☿ 07.7	☿ 41.4	25	1.5	85	5.2	145	8.8
26	☿ 06.5	☿ 08.0	☿ 41.6	26	1.6	86	5.2	146	8.9
27	☿ 06.8	☿ 08.2	☿ 41.8	27	1.6	87	5.3	147	8.9
28	☿ 07.0	☿ 08.5	☿ 42.1	28	1.7	88	5.4	148	9.0
29	☿ 07.3	☿ 08.7	☿ 42.3	29	1.8	89	5.4	149	9.1
30	☿ 07.5	☿ 09.0	☿ 42.6	30	1.8	90	5.5	150	9.1
31	☿ 07.8	☿ 09.2	☿ 42.8	31	1.9	91	5.5	151	9.2
32	☿ 08.0	☿ 09.5	☿ 43.0	32	1.9	92	5.6	152	9.2
33	☿ 08.3	☿ 09.8	☿ 43.3	33	2.0	93	5.7	153	9.3
34	☿ 08.5	☿ 10.0	☿ 43.5	34	2.1	94	5.7	154	9.4
35	☿ 08.8	☿ 10.3	☿ 43.8	35	2.1	95	5.8	155	9.4
36	☿ 09.0	☿ 10.5	☿ 44.0	36	2.2	96	5.8	156	9.5
37	☿ 09.3	☿ 10.8	☿ 44.2	37	2.3	97	5.9	157	9.6
38	☿ 09.5	☿ 11.0	☿ 44.5	38	2.3	98	6.0	158	9.6
39	☿ 09.8	☿ 11.3	☿ 44.7	39	2.4	99	6.0	159	9.7
40	☿ 10.0	☿ 11.5	☿ 44.9	40	2.4	100	6.1	160	9.7
41	☿ 10.3	☿ 11.8	☿ 45.2	41	2.5	101	6.1	161	9.8
42	☿ 10.5	☿ 12.0	☿ 45.4	42	2.6	102	6.2	162	9.9
43	☿ 10.8	☿ 12.3	☿ 45.7	43	2.6	103	6.3	163	9.9
44	☿ 11.0	☿ 12.5	☿ 45.9	44	2.7	104	6.3	164	10.0
45	☿ 11.3	☿ 12.8	☿ 46.1	45	2.7	105	6.4	165	10.0
46	☿ 11.5	☿ 13.0	☿ 46.4	46	2.8	106	6.4	166	10.1
47	☿ 11.8	☿ 13.3	☿ 46.6	47	2.9	107	6.5	167	10.2
48	☿ 12.0	☿ 13.5	☿ 46.9	48	2.9	108	6.6	168	10.2
49	☿ 12.3	☿ 13.8	☿ 47.1	49	3.0	109	6.6	169	10.3
50	☿ 12.5	☿ 14.0	☿ 47.3	50	3.0	110	6.7	170	10.3
51	☿ 12.8	☿ 14.3	☿ 47.6	51	3.1	111	6.8	171	10.4
52	☿ 13.0	☿ 14.5	☿ 47.8	52	3.2	112	6.8	172	10.5
53	☿ 13.3	☿ 14.8	☿ 48.0	53	3.2	113	6.9	173	10.5
54	☿ 13.5	☿ 15.0	☿ 48.3	54	3.3	114	6.9	174	10.6
55	☿ 13.8	☿ 15.3	☿ 48.5	55	3.3	115	7.0	175	10.6
56	☿ 14.0	☿ 15.5	☿ 48.8	56	3.4	116	7.1	176	10.7
57	☿ 14.3	☿ 15.8	☿ 49.0	57	3.5	117	7.1	177	10.8
58	☿ 14.5	☿ 16.0	☿ 49.2	58	3.5	118	7.2	178	10.8
59	☿ 14.8	☿ 16.3	☿ 49.5	59	3.6	119	7.2	179	10.9
60	☿ 15.0	☿ 16.5	☿ 49.7	60	3.7	120	7.3	180	11.0

Sec.	SUN PLANET	☿	MOON	code	corr'n	code	corr'n	code	corr'n
0	☿ 15.0	☿ 16.5	☿ 49.7	0	0.0	60	3.8	120	7.5
1	☿ 15.3	☿ 16.8	☿ 50.0	1	0.1	61	3.8	121	7.6
2	☿ 15.5	☿ 17.0	☿ 50.2	2	0.1	62	3.9	122	7.6
3	☿ 15.8	☿ 17.3	☿ 50.4	3	0.2	63	3.9	123	7.7
4	☿ 16.0	☿ 17.5	☿ 50.7	4	0.3	64	4.0	124	7.8
5	☿ 16.3	☿ 17.8	☿ 50.9	5	0.3	65	4.1	125	7.8
6	☿ 16.5	☿ 18.0	☿ 51.1	6	0.4	66	4.1	126	7.9
7	☿ 16.8	☿ 18.3	☿ 51.4	7	0.4	67	4.2	127	7.9
8	☿ 17.0	☿ 18.5	☿ 51.6	8	0.5	68	4.3	128	8.0
9	☿ 17.3	☿ 18.8	☿ 51.9	9	0.6	69	4.3	129	8.1
10	☿ 17.5	☿ 19.0	☿ 52.1	10	0.6	70	4.4	130	8.1
11	☿ 17.8	☿ 19.3	☿ 52.3	11	0.7	71	4.4	131	8.2
12	☿ 18.0	☿ 19.5	☿ 52.6	12	0.8	72	4.5	132	8.3
13	☿ 18.3	☿ 19.8	☿ 52.8	13	0.8	73	4.6	133	8.3
14	☿ 18.5	☿ 20.0	☿ 53.1	14	0.9	74	4.6	134	8.4
15	☿ 18.8	☿ 20.3	☿ 53.3	15	0.9	75	4.7	135	8.4
16	☿ 19.0	☿ 20.5	☿ 53.5	16	1.0	76	4.8	136	8.5
17	☿ 19.3	☿ 20.8	☿ 53.8	17	1.1	77	4.8	137	8.6
18	☿ 19.5	☿ 21.0	☿ 54.0	18	1.1	78	4.9	138	8.6
19	☿ 19.8	☿ 21.3	☿ 54.3	19	1.2	79	4.9	139	8.7
20	☿ 20.0	☿ 21.5	☿ 54.5	20	1.3	80	5.0	140	8.8
21	☿ 20.3	☿ 21.8	☿ 54.7	21	1.3	81	5.1	141	8.8
22	☿ 20.5	☿ 22.0	☿ 55.0	22	1.4	82	5.1	142	8.9
23	☿ 20.8	☿ 22.3	☿ 55.2	23	1.4	83	5.2	143	8.9
24	☿ 21.0	☿ 22.5	☿ 55.4	24	1.5	84	5.3	144	9.0
25	☿ 21.3	☿ 22.8	☿ 55.7	25	1.6	85	5.3	145	9.1
26	☿ 21.5	☿ 23.0	☿ 55.9	26	1.6	86	5.4	146	9.1
27	☿ 21.8	☿ 23.3	☿ 56.2	27	1.7	87	5.4	147	9.2
28	☿ 22.0	☿ 23.5	☿ 56.4	28	1.8	88	5.5	148	9.3
29	☿ 22.3	☿ 23.8	☿ 56.6	29	1.8	89	5.6	149	9.3
30	☿ 22.5	☿ 24.0	☿ 56.9	30	1.9	90	5.6	150	9.4
31	☿ 22.8	☿ 24.3	☿ 57.1	31	1.9	91	5.7	151	9.4
32	☿ 23.0	☿ 24.5	☿ 57.4	32	2.0	92	5.8	152	9.5
33	☿ 23.3	☿ 24.8	☿ 57.6	33	2.1	93	5.8	153	9.6
34	☿ 23.5	☿ 25.0	☿ 57.8	34	2.1	94	5.9	154	9.6
35	☿ 23.8	☿ 25.3	☿ 58.1	35	2.2	95	5.9	155	9.7
36	☿ 24.0	☿ 25.5	☿ 58.3	36	2.3	96	6.0	156	9.8
37	☿ 24.3	☿ 25.8	☿ 58.5	37	2.3	97	6.1	157	9.8
38	☿ 24.5	☿ 26.0	☿ 58.8	38	2.4	98	6.1	158	9.9
39	☿ 24.8	☿ 26.3	☿ 59.0	39	2.4	99	6.2	159	9.9
40	☿ 25.0	☿ 26.5	☿ 59.3	40	2.5	100	6.3	160	10.0
41	☿ 25.3	☿ 26.8	☿ 59.5	41	2.6	101	6.3	161	10.1
42	☿ 25.5	☿ 27.0	☿ 59.7	42	2.6	102	6.4	162	10.1
43	☿ 25.8	☿ 27.3	☿ 60.0	43	2.7	103	6.4	163	10.2
44	☿ 26.0	☿ 27.5	☿ 60.2	44	2.8	104	6.5	164	10.3
45	☿ 26.3	☿ 27.8	☿ 60.5	45	2.8	105	6.6	165	10.3
46	☿ 26.5	☿ 28.1	☿ 60.7	46	2.9	106	6.6	166	10.4
47	☿ 26.8	☿ 28.3	☿ 60.9	47	2.9	107	6.7	167	10.4
48	☿ 27.0	☿ 28.6	☿ 61.2	48	3.0	108	6.8	168	10.5
49	☿ 27.3	☿ 28.8	☿ 61.4	49	3.1	109	6.8	169	10.6
50	☿ 27.5	☿ 29.1	☿ 61.6	50	3.1	110	6.9	170	10.6
51	☿ 27.8	☿ 29.3	☿ 61.9	51	3.2	111	6.9	171	10.7
52	☿ 28.0	☿ 29.6	☿ 62.1	52	3.3	112	7.0	172	10.8
53	☿ 28.3	☿ 29.9	☿ 62.4	53	3.3	113	7.1	173	10.8
54	☿ 28.5	☿ 30.1	☿ 62.6	54	3.4	114	7.1	174	10.9
55	☿ 28.8	☿ 30.3	☿ 62.8	55	3.4	115	7.2	175	10.9
56	☿ 29.0	☿ 30.6	☿ 63.1	56	3.5	116	7.3	176	11.0
57	☿ 29.3	☿ 30.8	☿ 63.3	57	3.6	117	7.3	177	11.1
58	☿ 29.5	☿ 31.1	☿ 63.6	58	3.6	118	7.4	178	11.1
59	☿ 29.8	☿ 31.3	☿ 63.8	59	3.7	119	7.4	179	11.2
60	☿ 30.0	☿ 31.6	☿ 64.0	60	3.8	120	7.5	180	11.3

Sec.	SUN PLANET	☿	MOON	code	corr'n	code	corr'n	code	corr'n	Sec.	SUN PLANET	☿	MOON	code	corr'n	code	corr'n	code	corr'n
0	9 30.0	9 31.6	9 04.0	0 0.0	60 3.9	120 7.7		0	9 45.0	9 46.6	9 18.4	0 0.0	60 4.0	120 7.9					
1	9 30.3	9 31.8	9 04.3	1 0.1	61 3.9	121 7.8		1	9 45.3	9 46.9	9 18.6	1 0.1	61 4.0	121 8.0					
2	9 30.5	9 32.1	9 04.5	2 0.1	62 4.0	122 7.8		2	9 45.5	9 47.1	9 18.8	2 0.1	62 4.1	122 8.0					
3	9 30.8	9 32.3	9 04.7	3 0.2	63 4.0	123 7.9		3	9 45.8	9 47.4	9 19.1	3 0.2	63 4.1	123 8.1					
4	9 31.0	9 32.6	9 05.0	4 0.3	64 4.1	124 8.0		4	9 46.0	9 47.6	9 19.3	4 0.3	64 4.2	124 8.2					
5	9 31.3	9 32.8	9 05.2	5 0.3	65 4.2	125 8.0		5	9 46.3	9 47.9	9 19.5	5 0.3	65 4.3	125 8.2					
6	9 31.5	9 33.1	9 05.5	6 0.4	66 4.2	126 8.1		6	9 46.5	9 48.1	9 19.8	6 0.4	66 4.3	126 8.3					
7	9 31.8	9 33.3	9 05.7	7 0.4	67 4.3	127 8.1		7	9 46.8	9 48.4	9 20.0	7 0.5	67 4.4	127 8.4					
8	9 32.0	9 33.6	9 05.9	8 0.5	68 4.4	128 8.2		8	9 47.0	9 48.6	9 20.3	8 0.5	68 4.5	128 8.4					
9	9 32.3	9 33.8	9 06.2	9 0.6	69 4.4	129 8.3		9	9 47.3	9 48.9	9 20.5	9 0.6	69 4.5	129 8.5					
10	9 32.5	9 34.1	9 06.4	10 0.6	70 4.5	130 8.3		10	9 47.5	9 49.1	9 20.7	10 0.7	70 4.6	130 8.6					
11	9 32.8	9 34.3	9 06.7	11 0.7	71 4.6	131 8.4		11	9 47.8	9 49.4	9 21.0	11 0.7	71 4.7	131 8.6					
12	9 33.0	9 34.6	9 06.9	12 0.8	72 4.6	132 8.5		12	9 48.0	9 49.6	9 21.2	12 0.8	72 4.7	132 8.7					
13	9 33.3	9 34.8	9 07.1	13 0.8	73 4.7	133 8.5		13	9 48.3	9 49.9	9 21.5	13 0.9	73 4.8	133 8.8					
14	9 33.5	9 35.1	9 07.4	14 0.9	74 4.7	134 8.6		14	9 48.5	9 50.1	9 21.7	14 0.9	74 4.9	134 8.8					
15	9 33.8	9 35.3	9 07.6	15 1.0	75 4.8	135 8.7		15	9 48.8	9 50.4	9 21.9	15 1.0	75 4.9	135 8.9					
16	9 34.0	9 35.6	9 07.9	16 1.0	76 4.9	136 8.7		16	9 49.0	9 50.6	9 22.2	16 1.1	76 5.0	136 9.0					
17	9 34.3	9 35.8	9 08.1	17 1.1	77 4.9	137 8.8		17	9 49.3	9 50.9	9 22.4	17 1.1	77 5.1	137 9.0					
18	9 34.5	9 36.1	9 08.3	18 1.2	78 5.0	138 8.9		18	9 49.5	9 51.1	9 22.6	18 1.2	78 5.1	138 9.1					
19	9 34.8	9 36.3	9 08.6	19 1.2	79 5.1	139 8.9		19	9 49.8	9 51.4	9 22.9	19 1.3	79 5.2	139 9.2					
20	9 35.0	9 36.6	9 08.8	20 1.3	80 5.1	140 9.0		20	9 50.0	9 51.6	9 23.1	20 1.3	80 5.3	140 9.2					
21	9 35.3	9 36.8	9 09.0	21 1.3	81 5.2	141 9.0		21	9 50.3	9 51.9	9 23.4	21 1.4	81 5.3	141 9.3					
22	9 35.5	9 37.1	9 09.3	22 1.4	82 5.3	142 9.1		22	9 50.5	9 52.1	9 23.6	22 1.4	82 5.4	142 9.3					
23	9 35.8	9 37.3	9 09.5	23 1.5	83 5.3	143 9.2		23	9 50.8	9 52.4	9 23.8	23 1.5	83 5.5	143 9.4					
24	9 36.0	9 37.6	9 09.8	24 1.5	84 5.4	144 9.2		24	9 51.0	9 52.6	9 24.1	24 1.6	84 5.5	144 9.5					
25	9 36.3	9 37.8	9 10.0	25 1.6	85 5.5	145 9.3		25	9 51.3	9 52.9	9 24.3	25 1.6	85 5.6	145 9.5					
26	9 36.5	9 38.1	9 10.2	26 1.7	86 5.5	146 9.4		26	9 51.5	9 53.1	9 24.6	26 1.7	86 5.7	146 9.6					
27	9 36.8	9 38.3	9 10.5	27 1.7	87 5.6	147 9.4		27	9 51.8	9 53.4	9 24.8	27 1.8	87 5.7	147 9.7					
28	9 37.0	9 38.6	9 10.7	28 1.8	88 5.6	148 9.5		28	9 52.0	9 53.6	9 25.0	28 1.8	88 5.8	148 9.7					
29	9 37.3	9 38.8	9 11.0	29 1.9	89 5.7	149 9.6		29	9 52.3	9 53.9	9 25.3	29 1.9	89 5.9	149 9.8					
30	9 37.5	9 39.1	9 11.2	30 1.9	90 5.8	150 9.6		30	9 52.5	9 54.1	9 25.5	30 2.0	90 5.9	150 9.9					
31	9 37.8	9 39.3	9 11.4	31 2.0	91 5.8	151 9.7		31	9 52.8	9 54.4	9 25.7	31 2.0	91 6.0	151 9.9					
32	9 38.0	9 39.6	9 11.7	32 2.1	92 5.9	152 9.8		32	9 53.0	9 54.6	9 26.0	32 2.1	92 6.1	152 10.0					
33	9 38.3	9 39.8	9 11.9	33 2.1	93 6.0	153 9.8		33	9 53.3	9 54.9	9 26.2	33 2.2	93 6.1	153 10.1					
34	9 38.5	9 40.1	9 12.1	34 2.2	94 6.0	154 9.9		34	9 53.5	9 55.1	9 26.5	34 2.2	94 6.2	154 10.1					
35	9 38.8	9 40.3	9 12.4	35 2.2	95 6.1	155 9.9		35	9 53.8	9 55.4	9 26.7	35 2.3	95 6.3	155 10.2					
36	9 39.0	9 40.6	9 12.6	36 2.3	96 6.2	156 10.0		36	9 54.0	9 55.6	9 26.9	36 2.4	96 6.3	156 10.3					
37	9 39.3	9 40.8	9 12.9	37 2.4	97 6.2	157 10.1		37	9 54.3	9 55.9	9 27.2	37 2.4	97 6.4	157 10.3					
38	9 39.5	9 41.1	9 13.1	38 2.4	98 6.3	158 10.1		38	9 54.5	9 56.1	9 27.4	38 2.5	98 6.5	158 10.4					
39	9 39.8	9 41.3	9 13.3	39 2.5	99 6.4	159 10.2		39	9 54.8	9 56.4	9 27.7	39 2.6	99 6.5	159 10.5					
40	9 40.0	9 41.6	9 13.6	40 2.6	100 6.4	160 10.3		40	9 55.0	9 56.6	9 27.9	40 2.6	100 6.6	160 10.5					
41	9 40.3	9 41.8	9 13.8	41 2.6	101 6.5	161 10.3		41	9 55.3	9 56.9	9 28.1	41 2.7	101 6.6	161 10.6					
42	9 40.5	9 42.1	9 14.1	42 2.7	102 6.5	162 10.4		42	9 55.5	9 57.1	9 28.4	42 2.8	102 6.7	162 10.7					
43	9 40.8	9 42.3	9 14.3	43 2.8	103 6.6	163 10.5		43	9 55.8	9 57.4	9 28.6	43 2.8	103 6.8	163 10.7					
44	9 41.0	9 42.6	9 14.5	44 2.8	104 6.7	164 10.5		44	9 56.0	9 57.6	9 28.8	44 2.9	104 6.8	164 10.8					
45	9 41.3	9 42.8	9 14.8	45 2.9	105 6.7	165 10.6		45	9 56.3	9 57.9	9 29.1	45 3.0	105 6.9	165 10.9					
46	9 41.5	9 43.1	9 15.0	46 3.0	106 6.8	166 10.7		46	9 56.5	9 58.1	9 29.3	46 3.0	106 7.0	166 10.9					
47	9 41.8	9 43.3	9 15.2	47 3.0	107 6.9	167 10.7		47	9 56.8	9 58.4	9 29.6	47 3.1	107 7.0	167 11.0					
48	9 42.0	9 43.6	9 15.5	48 3.1	108 6.9	168 10.8		48	9 57.0	9 58.6	9 29.8	48 3.2	108 7.1	168 11.1					
49	9 42.3	9 43.8	9 15.7	49 3.1	109 7.0	169 10.8		49	9 57.3	9 58.9	9 30.0	49 3.2	109 7.2	169 11.1					
50	9 42.5	9 44.1	9 16.0	50 3.2	110 7.1	170 10.9		50	9 57.5	9 59.1	9 30.3	50 3.3	110 7.2	170 11.2					
51	9 42.8	9 44.3	9 16.2	51 3.3	111 7.1	171 11.0		51	9 57.8	9 59.4	9 30.5	51 3.4	111 7.3	171 11.3					
52	9 43.0	9 44.6	9 16.4	52 3.3	112 7.2	172 11.0		52	9 58.0	9 59.6	9 30.8	52 3.4	112 7.4	172 11.3					
53	9 43.3	9 44.8	9 16.7	53 3.4	113 7.3	173 11.1		53	9 58.3	9 59.9	9 31.0	53 3.5	113 7.4	173 11.4					
54	9 43.5	9 45.1	9 16.9	54 3.5	114 7.3	174 11.2		54	9 58.5	10 00.1	9 31.2	54 3.6	114 7.5	174 11.5					
55	9 43.8	9 45.3	9 17.2	55 3.5	115 7.4	175 11.2		55	9 58.8	10 00.4	9 31.5	55 3.6	115 7.6	175 11.5					
56	9 44.0	9 45.6	9 17.4	56 3.6	116 7.4	176 11.3		56	9 59.0	10 00.6	9 31.7	56 3.7	116 7.6	176 11.6					
57	9 44.3	9 45.8	9 17.6	57 3.7	117 7.5	177 11.4		57	9 59.3	10 00.9	9 32.0	57 3.8	117 7.7	177 11.7					
58	9 44.5	9 46.1	9 17.9	58 3.7	118 7.6	178 11.4		58	9 59.5	10 01.1	9 32.2	58 3.8	118 7.8	178 11.7					
59	9 44.8	9 46.4	9 18.1	59 3.8	119 7.6	179 11.5		59	9 59.8	10 01.4	9 32.4	59 3.9	119 7.8	179 11.8					
60	9 45.0	9 46.6	9 18.4	60 3.9	120 7.7	180 11.6		60	10 00.0	10 01.6	9 32.7	60 4.0	120 7.9	180 11.9					

Sec.	SUN PLANET	☿	MOON	code corr'n	code corr'n	code corr'n
0	10 00.0	10 01.6	9 32.7	0 0.0	60 4.1	120 8.1
1	10 00.3	10 01.9	9 32.9	1 0.1	61 4.1	121 8.2
2	10 00.5	10 02.1	9 33.1	2 0.1	62 4.2	122 8.2
3	10 00.8	10 02.4	9 33.4	3 0.2	63 4.3	123 8.3
4	10 01.0	10 02.6	9 33.6	4 0.3	64 4.3	124 8.4
5	10 01.3	10 02.9	9 33.9	5 0.3	65 4.4	125 8.4
6	10 01.5	10 03.1	9 34.1	6 0.4	66 4.5	126 8.5
7	10 01.8	10 03.4	9 34.3	7 0.5	67 4.5	127 8.6
8	10 02.0	10 03.6	9 34.6	8 0.5	68 4.6	128 8.6
9	10 02.3	10 03.9	9 34.8	9 0.6	69 4.7	129 8.7
10	10 02.5	10 04.1	9 35.1	10 0.7	70 4.7	130 8.8
11	10 02.8	10 04.4	9 35.3	11 0.7	71 4.8	131 8.8
12	10 03.0	10 04.7	9 35.5	12 0.8	72 4.9	132 8.9
13	10 03.3	10 04.9	9 35.8	13 0.9	73 4.9	133 9.0
14	10 03.5	10 05.2	9 36.0	14 0.9	74 5.0	134 9.0
15	10 03.8	10 05.4	9 36.2	15 1.0	75 5.1	135 9.1
16	10 04.0	10 05.7	9 36.5	16 1.1	76 5.1	136 9.2
17	10 04.3	10 05.9	9 36.7	17 1.1	77 5.2	137 9.2
18	10 04.5	10 06.2	9 37.0	18 1.2	78 5.3	138 9.3
19	10 04.8	10 06.4	9 37.2	19 1.3	79 5.3	139 9.4
20	10 05.0	10 06.7	9 37.4	20 1.4	80 5.4	140 9.5
21	10 05.3	10 06.9	9 37.7	21 1.4	81 5.5	141 9.5
22	10 05.5	10 07.2	9 37.9	22 1.5	82 5.5	142 9.6
23	10 05.8	10 07.4	9 38.2	23 1.6	83 5.6	143 9.7
24	10 06.0	10 07.7	9 38.4	24 1.6	84 5.7	144 9.7
25	10 06.3	10 07.9	9 38.6	25 1.7	85 5.7	145 9.8
26	10 06.5	10 08.2	9 38.9	26 1.8	86 5.8	146 9.9
27	10 06.8	10 08.4	9 39.1	27 1.8	87 5.9	147 9.9
28	10 07.0	10 08.7	9 39.3	28 1.9	88 5.9	148 10.0
29	10 07.3	10 08.9	9 39.6	29 2.0	89 6.0	149 10.1
30	10 07.5	10 09.2	9 39.8	30 2.0	90 6.1	150 10.1
31	10 07.8	10 09.4	9 40.1	31 2.1	91 6.1	151 10.2
32	10 08.0	10 09.7	9 40.3	32 2.2	92 6.2	152 10.3
33	10 08.3	10 09.9	9 40.5	33 2.2	93 6.3	153 10.3
34	10 08.5	10 10.2	9 40.8	34 2.3	94 6.3	154 10.4
35	10 08.8	10 10.4	9 41.0	35 2.4	95 6.4	155 10.5
36	10 09.0	10 10.7	9 41.3	36 2.4	96 6.5	156 10.5
37	10 09.3	10 10.9	9 41.5	37 2.5	97 6.5	157 10.6
38	10 09.5	10 11.2	9 41.7	38 2.6	98 6.6	158 10.7
39	10 09.8	10 11.4	9 42.0	39 2.6	99 6.7	159 10.7
40	10 10.0	10 11.7	9 42.2	40 2.7	100 6.8	160 10.8
41	10 10.3	10 11.9	9 42.4	41 2.8	101 6.8	161 10.9
42	10 10.5	10 12.2	9 42.7	42 2.8	102 6.9	162 10.9
43	10 10.8	10 12.4	9 42.9	43 2.9	103 7.0	163 11.0
44	10 11.0	10 12.7	9 43.2	44 3.0	104 7.0	164 11.1
45	10 11.3	10 12.9	9 43.4	45 3.0	105 7.1	165 11.1
46	10 11.5	10 13.2	9 43.6	46 3.1	106 7.2	166 11.2
47	10 11.8	10 13.4	9 43.9	47 3.2	107 7.2	167 11.3
48	10 12.0	10 13.7	9 44.1	48 3.2	108 7.3	168 11.3
49	10 12.3	10 13.9	9 44.4	49 3.3	109 7.4	169 11.4
50	10 12.5	10 14.2	9 44.6	50 3.4	110 7.4	170 11.5
51	10 12.8	10 14.4	9 44.8	51 3.4	111 7.5	171 11.5
52	10 13.0	10 14.7	9 45.1	52 3.5	112 7.6	172 11.6
53	10 13.3	10 14.9	9 45.3	53 3.6	113 7.6	173 11.7
54	10 13.5	10 15.2	9 45.6	54 3.6	114 7.7	174 11.7
55	10 13.8	10 15.4	9 45.8	55 3.7	115 7.8	175 11.8
56	10 14.0	10 15.7	9 46.0	56 3.8	116 7.8	176 11.9
57	10 14.3	10 15.9	9 46.3	57 3.8	117 7.9	177 11.9
58	10 14.5	10 16.2	9 46.5	58 3.9	118 8.0	178 12.0
59	10 14.8	10 16.4	9 46.7	59 4.0	119 8.0	179 12.1
60	10 15.0	10 16.7	9 47.0	60 4.1	120 8.1	180 12.2

Sec.	SUN PLANET	☿	MOON	code corr'n	code corr'n	code corr'n
0	10 15.0	10 16.7	9 47.0	0 0.0	60 4.2	120 8.3
1	10 15.3	10 16.9	9 47.2	1 0.1	61 4.2	121 8.4
2	10 15.5	10 17.2	9 47.5	2 0.1	62 4.3	122 8.4
3	10 15.8	10 17.4	9 47.7	3 0.2	63 4.4	123 8.5
4	10 16.0	10 17.7	9 47.9	4 0.3	64 4.4	124 8.6
5	10 16.3	10 17.9	9 48.2	5 0.3	65 4.5	125 8.6
6	10 16.5	10 18.2	9 48.4	6 0.4	66 4.6	126 8.7
7	10 16.8	10 18.4	9 48.7	7 0.5	67 4.6	127 8.8
8	10 17.0	10 18.7	9 48.9	8 0.6	68 4.7	128 8.9
9	10 17.3	10 18.9	9 49.1	9 0.6	69 4.8	129 8.9
10	10 17.5	10 19.2	9 49.4	10 0.7	70 4.8	130 9.0
11	10 17.8	10 19.4	9 49.6	11 0.8	71 4.9	131 9.1
12	10 18.0	10 19.7	9 49.8	12 0.8	72 5.0	132 9.1
13	10 18.3	10 19.9	9 50.1	13 0.9	73 5.0	133 9.2
14	10 18.5	10 20.2	9 50.3	14 1.0	74 5.1	134 9.3
15	10 18.8	10 20.4	9 50.6	15 1.0	75 5.2	135 9.3
16	10 19.0	10 20.7	9 50.8	16 1.1	76 5.3	136 9.4
17	10 19.3	10 20.9	9 51.0	17 1.2	77 5.3	137 9.5
18	10 19.5	10 21.2	9 51.3	18 1.2	78 5.4	138 9.5
19	10 19.8	10 21.4	9 51.5	19 1.3	79 5.5	139 9.6
20	10 20.0	10 21.7	9 51.8	20 1.4	80 5.5	140 9.7
21	10 20.3	10 21.9	9 52.0	21 1.5	81 5.6	141 9.8
22	10 20.5	10 22.2	9 52.2	22 1.5	82 5.7	142 9.8
23	10 20.8	10 22.4	9 52.5	23 1.6	83 5.7	143 9.9
24	10 21.0	10 22.7	9 52.7	24 1.7	84 5.8	144 10.0
25	10 21.3	10 23.0	9 52.9	25 1.7	85 5.9	145 10.0
26	10 21.5	10 23.2	9 53.2	26 1.8	86 5.9	146 10.1
27	10 21.8	10 23.5	9 53.4	27 1.9	87 6.0	147 10.2
28	10 22.0	10 23.7	9 53.7	28 1.9	88 6.1	148 10.2
29	10 22.3	10 24.0	9 53.9	29 2.0	89 6.2	149 10.3
30	10 22.5	10 24.2	9 54.1	30 2.1	90 6.2	150 10.4
31	10 22.8	10 24.5	9 54.4	31 2.1	91 6.3	151 10.4
32	10 23.0	10 24.7	9 54.6	32 2.2	92 6.4	152 10.5
33	10 23.3	10 25.0	9 54.9	33 2.3	93 6.4	153 10.6
34	10 23.5	10 25.2	9 55.1	34 2.4	94 6.5	154 10.7
35	10 23.8	10 25.5	9 55.3	35 2.4	95 6.6	155 10.7
36	10 24.0	10 25.7	9 55.6	36 2.5	96 6.6	156 10.8
37	10 24.3	10 26.0	9 55.8	37 2.6	97 6.7	157 10.9
38	10 24.5	10 26.2	9 56.1	38 2.6	98 6.8	158 10.9
39	10 24.8	10 26.5	9 56.3	39 2.7	99 6.8	159 11.0
40	10 25.0	10 26.7	9 56.5	40 2.8	100 6.9	160 11.1
41	10 25.3	10 27.0	9 56.8	41 2.8	101 7.0	161 11.1
42	10 25.5	10 27.2	9 57.0	42 2.9	102 7.1	162 11.2
43	10 25.8	10 27.5	9 57.2	43 3.0	103 7.1	163 11.3
44	10 26.0	10 27.7	9 57.5	44 3.0	104 7.2	164 11.3
45	10 26.3	10 28.0	9 57.7	45 3.1	105 7.3	165 11.4
46	10 26.5	10 28.2	9 58.0	46 3.2	106 7.3	166 11.5
47	10 26.8	10 28.5	9 58.2	47 3.3	107 7.4	167 11.6
48	10 27.0	10 28.7	9 58.4	48 3.3	108 7.5	168 11.6
49	10 27.3	10 29.0	9 58.7	49 3.4	109 7.5	169 11.7
50	10 27.5	10 29.2	9 58.9	50 3.5	110 7.6	170 11.8
51	10 27.8	10 29.5	9 59.2	51 3.5	111 7.7	171 11.8
52	10 28.0	10 29.7	9 59.4	52 3.6	112 7.7	172 11.9
53	10 28.3	10 30.0	9 59.6	53 3.7	113 7.8	173 12.0
54	10 28.5	10 30.2	9 59.9	54 3.7	114 7.9	174 12.0
55	10 28.8	10 30.5	10 00.1	55 3.8	115 8.0	175 12.1
56	10 29.0	10 30.7	10 00.3	56 3.9	116 8.0	176 12.2
57	10 29.3	10 31.0	10 00.6	57 3.9	117 8.1	177 12.2
58	10 29.5	10 31.2	10 00.8	58 4.0	118 8.2	178 12.3
59	10 29.8	10 31.5	10 01.1	59 4.1	119 8.2	179 12.4
60	10 30.0	10 31.7	10 01.3	60 4.2	120 8.3	180 12.5

Sec.	SUN PLANET	☿	MOON	code	corr'n	code	corr'n	code	corr'n	Sec.	SUN PLANET	☿	MOON	code	corr'n	code	corr'n	code	corr'n	
0	10 30.0	10 31.7	10 01.3	0 0.0	60 4.3	120 8.5	0	10 45.0	10 46.8	10 15.6	0 0.0	60 4.4	120 8.7	0	10 45.0	10 46.8	10 15.6	0 0.0	60 4.4	120 8.7
1	10 30.3	10 32.0	10 01.5	1 0.1	61 4.3	121 8.6	1	10 45.3	10 47.0	10 15.9	1 0.1	61 4.4	121 8.8	1	10 45.3	10 47.0	10 15.9	1 0.1	61 4.4	121 8.8
2	10 30.5	10 32.2	10 01.8	2 0.1	62 4.4	122 8.6	2	10 45.5	10 47.3	10 16.1	2 0.1	62 4.5	122 8.8	2	10 45.5	10 47.3	10 16.1	2 0.1	62 4.5	122 8.8
3	10 30.8	10 32.5	10 02.0	3 0.2	63 4.5	123 8.7	3	10 45.8	10 47.5	10 16.3	3 0.2	63 4.6	123 8.9	3	10 45.8	10 47.5	10 16.3	3 0.2	63 4.6	123 8.9
4	10 31.0	10 32.7	10 02.3	4 0.3	64 4.5	124 8.8	4	10 46.0	10 47.8	10 16.6	4 0.3	64 4.6	124 9.0	4	10 46.0	10 47.8	10 16.6	4 0.3	64 4.6	124 9.0
5	10 31.3	10 33.0	10 02.5	5 0.4	65 4.6	125 8.9	5	10 46.3	10 48.0	10 16.8	5 0.4	65 4.7	125 9.1	5	10 46.3	10 48.0	10 16.8	5 0.4	65 4.7	125 9.1
6	10 31.5	10 33.2	10 02.7	6 0.4	66 4.7	126 8.9	6	10 46.5	10 48.3	10 17.0	6 0.4	66 4.8	126 9.1	6	10 46.5	10 48.3	10 17.0	6 0.4	66 4.8	126 9.1
7	10 31.8	10 33.5	10 03.0	7 0.5	67 4.7	127 9.0	7	10 46.8	10 48.5	10 17.3	7 0.5	67 4.9	127 9.2	7	10 46.8	10 48.5	10 17.3	7 0.5	67 4.9	127 9.2
8	10 32.0	10 33.7	10 03.2	8 0.6	68 4.8	128 9.1	8	10 47.0	10 48.8	10 17.5	8 0.6	68 4.9	128 9.3	8	10 47.0	10 48.8	10 17.5	8 0.6	68 4.9	128 9.3
9	10 32.3	10 34.0	10 03.4	9 0.6	69 4.9	129 9.1	9	10 47.3	10 49.0	10 17.8	9 0.7	69 5.0	129 9.4	9	10 47.3	10 49.0	10 17.8	9 0.7	69 5.0	129 9.4
10	10 32.5	10 34.2	10 03.7	10 0.7	70 5.0	130 9.2	10	10 47.5	10 49.3	10 18.0	10 0.7	70 5.1	130 9.4	10	10 47.5	10 49.3	10 18.0	10 0.7	70 5.1	130 9.4
11	10 32.8	10 34.5	10 03.9	11 0.8	71 5.0	131 9.3	11	10 47.8	10 49.5	10 18.2	11 0.8	71 5.1	131 9.5	11	10 47.8	10 49.5	10 18.2	11 0.8	71 5.1	131 9.5
12	10 33.0	10 34.7	10 04.2	12 0.9	72 5.1	132 9.4	12	10 48.0	10 49.8	10 18.5	12 0.9	72 5.2	132 9.6	12	10 48.0	10 49.8	10 18.5	12 0.9	72 5.2	132 9.6
13	10 33.3	10 35.0	10 04.4	13 0.9	73 5.2	133 9.4	13	10 48.3	10 50.0	10 18.7	13 0.9	73 5.3	133 9.6	13	10 48.3	10 50.0	10 18.7	13 0.9	73 5.3	133 9.6
14	10 33.5	10 35.2	10 04.6	14 1.0	74 5.2	134 9.5	14	10 48.5	10 50.3	10 19.0	14 1.0	74 5.4	134 9.7	14	10 48.5	10 50.3	10 19.0	14 1.0	74 5.4	134 9.7
15	10 33.8	10 35.5	10 04.9	15 1.1	75 5.3	135 9.6	15	10 48.8	10 50.5	10 19.2	15 1.1	75 5.4	135 9.8	15	10 48.8	10 50.5	10 19.2	15 1.1	75 5.4	135 9.8
16	10 34.0	10 35.7	10 05.1	16 1.1	76 5.4	136 9.6	16	10 49.0	10 50.8	10 19.4	16 1.2	76 5.5	136 9.9	16	10 49.0	10 50.8	10 19.4	16 1.2	76 5.5	136 9.9
17	10 34.3	10 36.0	10 05.4	17 1.2	77 5.5	137 9.7	17	10 49.3	10 51.0	10 19.7	17 1.2	77 5.6	137 9.9	17	10 49.3	10 51.0	10 19.7	17 1.2	77 5.6	137 9.9
18	10 34.5	10 36.2	10 05.6	18 1.3	78 5.5	138 9.8	18	10 49.5	10 51.3	10 19.9	18 1.3	78 5.7	138 10.0	18	10 49.5	10 51.3	10 19.9	18 1.3	78 5.7	138 10.0
19	10 34.8	10 36.5	10 05.8	19 1.3	79 5.6	139 9.8	19	10 49.8	10 51.5	10 20.2	19 1.4	79 5.7	139 10.1	19	10 49.8	10 51.5	10 20.2	19 1.4	79 5.7	139 10.1
20	10 35.0	10 36.7	10 06.1	20 1.4	80 5.7	140 9.9	20	10 50.0	10 51.8	10 20.4	20 1.5	80 5.8	140 10.2	20	10 50.0	10 51.8	10 20.4	20 1.5	80 5.8	140 10.2
21	10 35.3	10 37.0	10 06.3	21 1.5	81 5.7	141 10.0	21	10 50.3	10 52.0	10 20.6	21 1.5	81 5.9	141 10.2	21	10 50.3	10 52.0	10 20.6	21 1.5	81 5.9	141 10.2
22	10 35.5	10 37.2	10 06.5	22 1.6	82 5.8	142 10.1	22	10 50.5	10 52.3	10 20.9	22 1.6	82 5.9	142 10.3	22	10 50.5	10 52.3	10 20.9	22 1.6	82 5.9	142 10.3
23	10 35.8	10 37.5	10 06.8	23 1.6	83 5.9	143 10.1	23	10 50.8	10 52.5	10 21.1	23 1.7	83 6.0	143 10.4	23	10 50.8	10 52.5	10 21.1	23 1.7	83 6.0	143 10.4
24	10 36.0	10 37.7	10 07.0	24 1.7	84 6.0	144 10.2	24	10 51.0	10 52.8	10 21.3	24 1.7	84 6.1	144 10.4	24	10 51.0	10 52.8	10 21.3	24 1.7	84 6.1	144 10.4
25	10 36.3	10 38.0	10 07.3	25 1.8	85 6.0	145 10.3	25	10 51.3	10 53.0	10 21.6	25 1.8	85 6.2	145 10.5	25	10 51.3	10 53.0	10 21.6	25 1.8	85 6.2	145 10.5
26	10 36.5	10 38.2	10 07.5	26 1.8	86 6.1	146 10.3	26	10 51.5	10 53.3	10 21.8	26 1.9	86 6.2	146 10.6	26	10 51.5	10 53.3	10 21.8	26 1.9	86 6.2	146 10.6
27	10 36.8	10 38.5	10 07.7	27 1.9	87 6.2	147 10.4	27	10 51.8	10 53.5	10 22.1	27 2.0	87 6.3	147 10.7	27	10 51.8	10 53.5	10 22.1	27 2.0	87 6.3	147 10.7
28	10 37.0	10 38.7	10 08.0	28 2.0	88 6.2	148 10.5	28	10 52.0	10 53.8	10 22.3	28 2.0	88 6.4	148 10.7	28	10 52.0	10 53.8	10 22.3	28 2.0	88 6.4	148 10.7
29	10 37.3	10 39.0	10 08.2	29 2.1	89 6.3	149 10.6	29	10 52.3	10 54.0	10 22.5	29 2.1	89 6.5	149 10.8	29	10 52.3	10 54.0	10 22.5	29 2.1	89 6.5	149 10.8
30	10 37.5	10 39.2	10 08.5	30 2.1	90 6.4	150 10.6	30	10 52.5	10 54.3	10 22.8	30 2.2	90 6.5	150 10.9	30	10 52.5	10 54.3	10 22.8	30 2.2	90 6.5	150 10.9
31	10 37.8	10 39.5	10 08.7	31 2.2	91 6.4	151 10.7	31	10 52.8	10 54.5	10 23.0	31 2.2	91 6.6	151 10.9	31	10 52.8	10 54.5	10 23.0	31 2.2	91 6.6	151 10.9
32	10 38.0	10 39.7	10 08.9	32 2.3	92 6.5	152 10.8	32	10 53.0	10 54.8	10 23.3	32 2.3	92 6.7	152 11.0	32	10 53.0	10 54.8	10 23.3	32 2.3	92 6.7	152 11.0
33	10 38.3	10 40.0	10 09.2	33 2.3	93 6.6	153 10.8	33	10 53.3	10 55.0	10 23.5	33 2.4	93 6.7	153 11.1	33	10 53.3	10 55.0	10 23.5	33 2.4	93 6.7	153 11.1
34	10 38.5	10 40.2	10 09.4	34 2.4	94 6.7	154 10.9	34	10 53.5	10 55.3	10 23.7	34 2.5	94 6.8	154 11.2	34	10 53.5	10 55.3	10 23.7	34 2.5	94 6.8	154 11.2
35	10 38.8	10 40.5	10 09.7	35 2.5	95 6.7	155 11.0	35	10 53.8	10 55.5	10 24.0	35 2.5	95 6.9	155 11.2	35	10 53.8	10 55.5	10 24.0	35 2.5	95 6.9	155 11.2
36	10 39.0	10 40.7	10 09.9	36 2.6	96 6.8	156 11.1	36	10 54.0	10 55.8	10 24.2	36 2.6	96 7.0	156 11.3	36	10 54.0	10 55.8	10 24.2	36 2.6	96 7.0	156 11.3
37	10 39.3	10 41.0	10 10.1	37 2.6	97 6.9	157 11.1	37	10 54.3	10 56.0	10 24.4	37 2.7	97 7.0	157 11.4	37	10 54.3	10 56.0	10 24.4	37 2.7	97 7.0	157 11.4
38	10 39.5	10 41.3	10 10.4	38 2.7	98 6.9	158 11.2	38	10 54.5	10 56.3	10 24.7	38 2.8	98 7.1	158 11.5	38	10 54.5	10 56.3	10 24.7	38 2.8	98 7.1	158 11.5
39	10 39.8	10 41.5	10 10.6	39 2.8	99 7.0	159 11.3	39	10 54.8	10 56.5	10 24.9	39 2.8	99 7.2	159 11.5	39	10 54.8	10 56.5	10 24.9	39 2.8	99 7.2	159 11.5
40	10 40.0	10 41.8	10 10.8	40 2.8	100 7.1	160 11.3	40	10 55.0	10 56.8	10 25.2	40 2.9	100 7.3	160 11.6	40	10 55.0	10 56.8	10 25.2	40 2.9	100 7.3	160 11.6
41	10 40.3	10 42.0	10 11.1	41 2.9	101 7.2	161 11.4	41	10 55.3	10 57.0	10 25.4	41 3.0	101 7.3	161 11.7	41	10 55.3	10 57.0	10 25.4	41 3.0	101 7.3	161 11.7
42	10 40.5	10 42.3	10 11.3	42 3.0	102 7.2	162 11.5	42	10 55.5	10 57.3	10 25.6	42 3.0	102 7.4	162 11.7	42	10 55.5	10 57.3	10 25.6	42 3.0	102 7.4	162 11.7
43	10 40.8	10 42.5	10 11.6	43 3.0	103 7.3	163 11.5	43	10 55.8	10 57.5	10 25.9	43 3.1	103 7.5	163 11.8	43	10 55.8	10 57.5	10 25.9	43 3.1	103 7.5	163 11.8
44	10 41.0	10 42.8	10 11.8	44 3.1	104 7.4	164 11.6	44	10 56.0	10 57.8	10 26.1	44 3.2	104 7.5	164 11.9	44	10 56.0	10 57.8	10 26.1	44 3.2	104 7.5	164 11.9
45	10 41.3	10 43.0	10 12.0	45 3.2	105 7.4	165 11.7	45	10 56.3	10 58.0	10 26.4	45 3.3	105 7.6	165 12.0	45	10 56.3	10 58.0	10 26.4	45 3.3	105 7.6	165 12.0
46	10 41.5	10 43.3	10 12.3	46 3.3	106 7.5	166 11.8	46	10 56.5	10 58.3	10 26.6	46 3.3	106 7.7	166 12.0	46	10 56.5	10 58.3	10 26.6	46 3.3	106 7.7	166 12.0
47	10 41.8	10 43.5	10 12.5	47 3.3	107 7.6	167 11.8	47	10 56.8	10 58.5	10 26.8	47 3.4	107 7.8	167 12.1	47	10 56.8	10 58.5	10 26.8	47 3.4	107 7.8	167 12.1
48	10 42.0	10 43.8	10 12.8	48 3.4	108 7.7	168 11.9	48	10 57.0	10 58.8	10 27.1	48 3.5	108 7.8	168 12.2	48	10 57.0	10 58.8	10 27.1	48 3.5	108 7.8	168 12.2
49	10 42.3	10 44.0	10 13.0	49 3.5	109 7.7	169 12.0	49	10 57.3	10 59.0	10 27.3	49 3.6	109 7.9	169 12.3	49	10 57.3	10 59.0	10 27.3	49 3.6	109 7.9	169 12.3
50	10 42.5	10 44.3	10 13.2	50 3.5	110 7.8	170 12.0	50	10 57.5	10 59.3	10 27.5	50 3.6	110 8.0	170 12.3	50	10 57.5	10 59.3				

Sec.	SUN PLANET	☿	MOON	code corr'n	code corr'n	code corr'n
0	11 00.0	11 01.8	10 29.9	0 0.0	60 4.5	120 8.9
1	11 00.3	11 02.1	10 30.2	1 0.1	61 4.5	121 9.0
2	11 00.5	11 02.3	10 30.4	2 0.1	62 4.6	122 9.0
3	11 00.8	11 02.6	10 30.6	3 0.2	63 4.7	123 9.1
4	11 01.0	11 02.8	10 30.9	4 0.3	64 4.7	124 9.2
5	11 01.3	11 03.1	10 31.1	5 0.4	65 4.8	125 9.3
6	11 01.5	11 03.3	10 31.4	6 0.4	66 4.9	126 9.3
7	11 01.8	11 03.6	10 31.6	7 0.5	67 5.0	127 9.4
8	11 02.0	11 03.8	10 31.8	8 0.6	68 5.0	128 9.5
9	11 02.3	11 04.1	10 32.1	9 0.7	69 5.1	129 9.6
10	11 02.5	11 04.3	10 32.3	10 0.7	70 5.2	130 9.6
11	11 02.8	11 04.6	10 32.6	11 0.8	71 5.3	131 9.7
12	11 03.0	11 04.8	10 32.8	12 0.9	72 5.3	132 9.8
13	11 03.3	11 05.1	10 33.0	13 1.0	73 5.4	133 9.9
14	11 03.5	11 05.3	10 33.3	14 1.0	74 5.5	134 9.9
15	11 03.8	11 05.6	10 33.5	15 1.1	75 5.6	135 10.0
16	11 04.0	11 05.8	10 33.8	16 1.2	76 5.6	136 10.1
17	11 04.3	11 06.1	10 34.0	17 1.3	77 5.7	137 10.2
18	11 04.5	11 06.3	10 34.2	18 1.3	78 5.8	138 10.2
19	11 04.8	11 06.6	10 34.5	19 1.4	79 5.9	139 10.3
20	11 05.0	11 06.8	10 34.7	20 1.5	80 5.9	140 10.4
21	11 05.3	11 07.1	10 34.9	21 1.6	81 6.0	141 10.5
22	11 05.5	11 07.3	10 35.2	22 1.6	82 6.1	142 10.5
23	11 05.8	11 07.6	10 35.4	23 1.7	83 6.2	143 10.6
24	11 06.0	11 07.8	10 35.7	24 1.8	84 6.2	144 10.7
25	11 06.3	11 08.1	10 35.9	25 1.9	85 6.3	145 10.8
26	11 06.5	11 08.3	10 36.1	26 1.9	86 6.4	146 10.8
27	11 06.8	11 08.6	10 36.4	27 2.0	87 6.5	147 10.9
28	11 07.0	11 08.8	10 36.6	28 2.1	88 6.5	148 11.0
29	11 07.3	11 09.1	10 36.9	29 2.2	89 6.6	149 11.1
30	11 07.5	11 09.3	10 37.1	30 2.2	90 6.7	150 11.1
31	11 07.8	11 09.6	10 37.3	31 2.3	91 6.7	151 11.2
32	11 08.0	11 09.8	10 37.6	32 2.4	92 6.8	152 11.3
33	11 08.3	11 10.1	10 37.8	33 2.4	93 6.9	153 11.3
34	11 08.5	11 10.3	10 38.0	34 2.5	94 7.0	154 11.4
35	11 08.8	11 10.6	10 38.3	35 2.6	95 7.0	155 11.5
36	11 09.0	11 10.8	10 38.5	36 2.7	96 7.1	156 11.6
37	11 09.3	11 11.1	10 38.8	37 2.7	97 7.2	157 11.6
38	11 09.5	11 11.3	10 39.0	38 2.8	98 7.3	158 11.7
39	11 09.8	11 11.6	10 39.2	39 2.9	99 7.3	159 11.8
40	11 10.0	11 11.8	10 39.5	40 3.0	100 7.4	160 11.9
41	11 10.3	11 12.1	10 39.7	41 3.0	101 7.5	161 11.9
42	11 10.5	11 12.3	10 40.0	42 3.1	102 7.6	162 12.0
43	11 10.8	11 12.6	10 40.2	43 3.2	103 7.6	163 12.1
44	11 11.0	11 12.8	10 40.4	44 3.3	104 7.7	164 12.2
45	11 11.3	11 13.1	10 40.7	45 3.3	105 7.8	165 12.2
46	11 11.5	11 13.3	10 40.9	46 3.4	106 7.9	166 12.3
47	11 11.8	11 13.6	10 41.1	47 3.5	107 7.9	167 12.4
48	11 12.0	11 13.8	10 41.4	48 3.6	108 8.0	168 12.5
49	11 12.3	11 14.1	10 41.6	49 3.6	109 8.1	169 12.5
50	11 12.5	11 14.3	10 41.9	50 3.7	110 8.2	170 12.6
51	11 12.8	11 14.6	10 42.1	51 3.8	111 8.2	171 12.7
52	11 13.0	11 14.8	10 42.3	52 3.9	112 8.3	172 12.8
53	11 13.3	11 15.1	10 42.6	53 3.9	113 8.4	173 12.8
54	11 13.5	11 15.3	10 42.8	54 4.0	114 8.5	174 12.9
55	11 13.8	11 15.6	10 43.1	55 4.1	115 8.5	175 13.0
56	11 14.0	11 15.8	10 43.3	56 4.2	116 8.6	176 13.1
57	11 14.3	11 16.1	10 43.5	57 4.2	117 8.7	177 13.1
58	11 14.5	11 16.3	10 43.8	58 4.3	118 8.8	178 13.2
59	11 14.8	11 16.6	10 44.0	59 4.4	119 8.8	179 13.3
60	11 15.0	11 16.8	10 44.3	60 4.5	120 8.9	180 13.4

Sec.	SUN PLANET	☿	MOON	code corr'n	code corr'n	code corr'n
0	11 15.0	11 16.8	10 44.3	0 0.0	60 4.6	120 9.1
1	11 15.3	11 17.1	10 44.5	1 0.1	61 4.6	121 9.2
2	11 15.5	11 17.3	10 44.7	2 0.2	62 4.7	122 9.3
3	11 15.8	11 17.6	10 45.0	3 0.2	63 4.8	123 9.3
4	11 16.0	11 17.9	10 45.2	4 0.3	64 4.9	124 9.4
5	11 16.3	11 18.1	10 45.4	5 0.4	65 4.9	125 9.5
6	11 16.5	11 18.4	10 45.7	6 0.5	66 5.0	126 9.6
7	11 16.8	11 18.6	10 45.9	7 0.5	67 5.1	127 9.6
8	11 17.0	11 18.9	10 46.2	8 0.6	68 5.2	128 9.7
9	11 17.3	11 19.1	10 46.4	9 0.7	69 5.2	129 9.8
10	11 17.5	11 19.4	10 46.6	10 0.8	70 5.3	130 9.9
11	11 17.8	11 19.6	10 46.9	11 0.8	71 5.4	131 9.9
12	11 18.0	11 19.9	10 47.1	12 0.9	72 5.5	132 10.0
13	11 18.3	11 20.1	10 47.4	13 1.0	73 5.5	133 10.1
14	11 18.5	11 20.4	10 47.6	14 1.1	74 5.6	134 10.2
15	11 18.8	11 20.6	10 47.8	15 1.1	75 5.7	135 10.2
16	11 19.0	11 20.9	10 48.1	16 1.2	76 5.8	136 10.3
17	11 19.3	11 21.1	10 48.3	17 1.3	77 5.8	137 10.4
18	11 19.5	11 21.4	10 48.5	18 1.4	78 5.9	138 10.5
19	11 19.8	11 21.6	10 48.8	19 1.4	79 6.0	139 10.5
20	11 20.0	11 21.9	10 49.0	20 1.5	80 6.1	140 10.6
21	11 20.3	11 22.1	10 49.3	21 1.6	81 6.1	141 10.7
22	11 20.5	11 22.4	10 49.5	22 1.7	82 6.2	142 10.8
23	11 20.8	11 22.6	10 49.7	23 1.7	83 6.3	143 10.8
24	11 21.0	11 22.9	10 50.0	24 1.8	84 6.4	144 10.9
25	11 21.3	11 23.1	10 50.2	25 1.9	85 6.4	145 11.0
26	11 21.5	11 23.4	10 50.5	26 2.0	86 6.5	146 11.1
27	11 21.8	11 23.6	10 50.7	27 2.0	87 6.6	147 11.1
28	11 22.0	11 23.9	10 50.9	28 2.1	88 6.7	148 11.2
29	11 22.3	11 24.1	10 51.2	29 2.2	89 6.7	149 11.3
30	11 22.5	11 24.4	10 51.4	30 2.3	90 6.8	150 11.4
31	11 22.8	11 24.6	10 51.6	31 2.4	91 6.9	151 11.5
32	11 23.0	11 24.9	10 51.9	32 2.4	92 7.0	152 11.5
33	11 23.3	11 25.1	10 52.1	33 2.5	93 7.1	153 11.6
34	11 23.5	11 25.4	10 52.4	34 2.6	94 7.1	154 11.7
35	11 23.8	11 25.6	10 52.6	35 2.7	95 7.2	155 11.8
36	11 24.0	11 25.9	10 52.8	36 2.7	96 7.3	156 11.8
37	11 24.3	11 26.1	10 53.1	37 2.8	97 7.4	157 11.9
38	11 24.5	11 26.4	10 53.3	38 2.9	98 7.4	158 12.0
39	11 24.8	11 26.6	10 53.6	39 3.0	99 7.5	159 12.1
40	11 25.0	11 26.9	10 53.8	40 3.0	100 7.6	160 12.1
41	11 25.3	11 27.1	10 54.0	41 3.1	101 7.7	161 12.2
42	11 25.5	11 27.4	10 54.3	42 3.2	102 7.7	162 12.3
43	11 25.8	11 27.6	10 54.5	43 3.3	103 7.8	163 12.4
44	11 26.0	11 27.9	10 54.7	44 3.3	104 7.9	164 12.4
45	11 26.3	11 28.1	10 55.0	45 3.4	105 8.0	165 12.5
46	11 26.5	11 28.4	10 55.2	46 3.5	106 8.0	166 12.6
47	11 26.8	11 28.6	10 55.5	47 3.6	107 8.1	167 12.7
48	11 27.0	11 28.9	10 55.7	48 3.6	108 8.2	168 12.7
49	11 27.3	11 29.1	10 55.9	49 3.7	109 8.3	169 12.8
50	11 27.5	11 29.4	10 56.2	50 3.8	110 8.3	170 12.9
51	11 27.8	11 29.6	10 56.4	51 3.9	111 8.4	171 13.0
52	11 28.0	11 29.9	10 56.7	52 3.9	112 8.5	172 13.0
53	11 28.3	11 30.1	10 56.9	53 4.0	113 8.6	173 13.1
54	11 28.5	11 30.4	10 57.1	54 4.1	114 8.6	174 13.2
55	11 28.8	11 30.6	10 57.4	55 4.2	115 8.7	175 13.3
56	11 29.0	11 30.9	10 57.6	56 4.2	116 8.8	176 13.3
57	11 29.3	11 31.1	10 57.9	57 4.3	117 8.9	177 13.4
58	11 29.5	11 31.4	10 58.1	58 4.4	118 8.9	178 13.5
59	11 29.8	11 31.6	10 58.3	59 4.5	119 9.0	179 13.6
60	11 30.0	11 31.9	10 58.6	60 4.6	120 9.1	180 13.7

Sec.	SUN PLANET	☿	MOON	code	corr'n	code	corr'n	code	corr'n	Sec.	SUN PLANET	☿	MOON	code	corr'n	code	corr'n	code	corr'n
0	11 30.0	11 31.9	10 58.6	0	0.0	60	4.7	120	9.3	0	11 45.0	11 46.9	11 12.9	0	0.0	60	4.8	120	9.5
1	11 30.3	11 32.1	10 58.8	1	0.1	61	4.7	121	9.4	1	11 45.3	11 47.2	11 13.1	1	0.1	61	4.8	121	9.6
2	11 30.5	11 32.4	10 59.0	2	0.2	62	4.8	122	9.5	2	11 45.5	11 47.4	11 13.4	2	0.2	62	4.9	122	9.7
3	11 30.8	11 32.6	10 59.3	3	0.2	63	4.9	123	9.5	3	11 45.8	11 47.7	11 13.6	3	0.2	63	5.0	123	9.7
4	11 31.0	11 32.9	10 59.5	4	0.3	64	5.0	124	9.6	4	11 46.0	11 47.9	11 13.8	4	0.3	64	5.1	124	9.8
5	11 31.3	11 33.1	10 59.8	5	0.4	65	5.0	125	9.7	5	11 46.3	11 48.2	11 14.1	5	0.4	65	5.1	125	9.9
6	11 31.5	11 33.4	11 00.0	6	0.5	66	5.1	126	9.8	6	11 46.5	11 48.4	11 14.3	6	0.5	66	5.2	126	10.0
7	11 31.8	11 33.6	11 00.2	7	0.5	67	5.2	127	9.8	7	11 46.8	11 48.7	11 14.6	7	0.6	67	5.3	127	10.1
8	11 32.0	11 33.9	11 00.5	8	0.6	68	5.3	128	9.9	8	11 47.0	11 48.9	11 14.8	8	0.6	68	5.4	128	10.1
9	11 32.3	11 34.1	11 00.7	9	0.7	69	5.3	129	10.0	9	11 47.3	11 49.2	11 15.0	9	0.7	69	5.5	129	10.2
10	11 32.5	11 34.4	11 01.0	10	0.8	70	5.4	130	10.1	10	11 47.5	11 49.4	11 15.3	10	0.8	70	5.5	130	10.3
11	11 32.8	11 34.6	11 01.2	11	0.9	71	5.5	131	10.2	11	11 47.8	11 49.7	11 15.5	11	0.9	71	5.6	131	10.4
12	11 33.0	11 34.9	11 01.4	12	0.9	72	5.6	132	10.2	12	11 48.0	11 49.9	11 15.7	12	1.0	72	5.7	132	10.5
13	11 33.3	11 35.1	11 01.7	13	1.0	73	5.7	133	10.3	13	11 48.3	11 50.2	11 16.0	13	1.0	73	5.8	133	10.5
14	11 33.5	11 35.4	11 01.9	14	1.1	74	5.7	134	10.4	14	11 48.5	11 50.4	11 16.2	14	1.1	74	5.9	134	10.6
15	11 33.8	11 35.6	11 02.1	15	1.2	75	5.8	135	10.5	15	11 48.8	11 50.7	11 16.5	15	1.2	75	5.9	135	10.7
16	11 34.0	11 35.9	11 02.4	16	1.2	76	5.9	136	10.5	16	11 49.0	11 50.9	11 16.7	16	1.3	76	6.0	136	10.8
17	11 34.3	11 36.2	11 02.6	17	1.3	77	6.0	137	10.6	17	11 49.3	11 51.2	11 16.9	17	1.3	77	6.1	137	10.8
18	11 34.5	11 36.4	11 02.9	18	1.4	78	6.0	138	10.7	18	11 49.5	11 51.4	11 17.2	18	1.4	78	6.2	138	10.9
19	11 34.8	11 36.7	11 03.1	19	1.5	79	6.1	139	10.8	19	11 49.8	11 51.7	11 17.4	19	1.5	79	6.3	139	11.0
20	11 35.0	11 36.9	11 03.3	20	1.6	80	6.2	140	10.9	20	11 50.0	11 51.9	11 17.7	20	1.6	80	6.3	140	11.1
21	11 35.3	11 37.2	11 03.6	21	1.6	81	6.3	141	10.9	21	11 50.3	11 52.2	11 17.9	21	1.7	81	6.4	141	11.2
22	11 35.5	11 37.4	11 03.8	22	1.7	82	6.4	142	11.0	22	11 50.5	11 52.4	11 18.1	22	1.7	82	6.5	142	11.2
23	11 35.8	11 37.7	11 04.1	23	1.8	83	6.4	143	11.1	23	11 50.8	11 52.7	11 18.4	23	1.8	83	6.6	143	11.3
24	11 36.0	11 37.9	11 04.3	24	1.9	84	6.5	144	11.2	24	11 51.0	11 52.9	11 18.6	24	1.9	84	6.7	144	11.4
25	11 36.3	11 38.2	11 04.5	25	1.9	85	6.6	145	11.2	25	11 51.3	11 53.2	11 18.8	25	2.0	85	6.7	145	11.5
26	11 36.5	11 38.4	11 04.8	26	2.0	86	6.7	146	11.3	26	11 51.5	11 53.4	11 19.1	26	2.1	86	6.8	146	11.6
27	11 36.8	11 38.7	11 05.0	27	2.1	87	6.7	147	11.4	27	11 51.8	11 53.7	11 19.3	27	2.1	87	6.9	147	11.6
28	11 37.0	11 38.9	11 05.2	28	2.2	88	6.8	148	11.5	28	11 52.0	11 53.9	11 19.6	28	2.2	88	7.0	148	11.7
29	11 37.3	11 39.2	11 05.5	29	2.2	89	6.9	149	11.5	29	11 52.3	11 54.2	11 19.8	29	2.3	89	7.0	149	11.8
30	11 37.5	11 39.4	11 05.7	30	2.3	90	7.0	150	11.6	30	11 52.5	11 54.5	11 20.0	30	2.4	90	7.1	150	11.9
31	11 37.8	11 39.7	11 06.0	31	2.4	91	7.1	151	11.7	31	11 52.8	11 54.7	11 20.3	31	2.5	91	7.2	151	12.0
32	11 38.0	11 39.9	11 06.2	32	2.5	92	7.1	152	11.8	32	11 53.0	11 55.0	11 20.5	32	2.5	92	7.3	152	12.0
33	11 38.3	11 40.2	11 06.4	33	2.6	93	7.2	153	11.9	33	11 53.3	11 55.2	11 20.8	33	2.6	93	7.4	153	12.1
34	11 38.5	11 40.4	11 06.7	34	2.6	94	7.3	154	11.9	34	11 53.5	11 55.5	11 21.0	34	2.7	94	7.4	154	12.2
35	11 38.8	11 40.7	11 06.9	35	2.7	95	7.4	155	12.0	35	11 53.8	11 55.7	11 21.2	35	2.8	95	7.5	155	12.3
36	11 39.0	11 40.9	11 07.2	36	2.8	96	7.4	156	12.1	36	11 54.0	11 56.0	11 21.5	36	2.9	96	7.6	156	12.4
37	11 39.3	11 41.2	11 07.4	37	2.9	97	7.5	157	12.2	37	11 54.3	11 56.2	11 21.7	37	2.9	97	7.7	157	12.4
38	11 39.5	11 41.4	11 07.6	38	2.9	98	7.6	158	12.2	38	11 54.5	11 56.5	11 22.0	38	3.0	98	7.8	158	12.5
39	11 39.8	11 41.7	11 07.9	39	3.0	99	7.7	159	12.3	39	11 54.8	11 56.7	11 22.2	39	3.1	99	7.8	159	12.6
40	11 40.0	11 41.9	11 08.1	40	3.1	100	7.8	160	12.4	40	11 55.0	11 57.0	11 22.4	40	3.2	100	7.9	160	12.7
41	11 40.3	11 42.2	11 08.3	41	3.2	101	7.8	161	12.5	41	11 55.3	11 57.2	11 22.7	41	3.2	101	8.0	161	12.7
42	11 40.5	11 42.4	11 08.6	42	3.3	102	7.9	162	12.6	42	11 55.5	11 57.5	11 22.9	42	3.3	102	8.1	162	12.8
43	11 40.8	11 42.7	11 08.8	43	3.3	103	8.0	163	12.6	43	11 55.8	11 57.7	11 23.1	43	3.4	103	8.2	163	12.9
44	11 41.0	11 42.9	11 09.1	44	3.4	104	8.1	164	12.7	44	11 56.0	11 58.0	11 23.4	44	3.5	104	8.2	164	13.0
45	11 41.3	11 43.2	11 09.3	45	3.5	105	8.1	165	12.8	45	11 56.3	11 58.2	11 23.6	45	3.6	105	8.3	165	13.1
46	11 41.5	11 43.4	11 09.5	46	3.6	106	8.2	166	12.9	46	11 56.5	11 58.5	11 23.9	46	3.6	106	8.4	166	13.1
47	11 41.8	11 43.7	11 09.8	47	3.6	107	8.3	167	12.9	47	11 56.8	11 58.7	11 24.1	47	3.7	107	8.5	167	13.2
48	11 42.0	11 43.9	11 10.0	48	3.7	108	8.4	168	13.0	48	11 57.0	11 59.0	11 24.3	48	3.8	108	8.6	168	13.3
49	11 42.3	11 44.2	11 10.3	49	3.8	109	8.4	169	13.1	49	11 57.3	11 59.2	11 24.6	49	3.9	109	8.6	169	13.4
50	11 42.5	11 44.4	11 10.5	50	3.9	110	8.5	170	13.2	50	11 57.5	11 59.5	11 24.8	50	4.0	110	8.7	170	13.5
51	11 42.8	11 44.7	11 10.7	51	4.0	111	8.6	171	13.3	51	11 57.8	11 59.7	11 25.1	51	4.0	111	8.8	171	13.5
52	11 43.0	11 44.9	11 11.0	52	4.0	112	8.7	172	13.3	52	11 58.0	12 00.0	11 25.3	52	4.1	112	8.9	172	13.6
53	11 43.3	11 45.2	11 11.2	53	4.1	113	8.8	173	13.4	53	11 58.3	12 00.2	11 25.5	53	4.2	113	8.9	173	13.7
54	11 43.5	11 45.4	11 11.5	54	4.2	114	8.8	174	13.5	54	11 58.5	12 00.5	11 25.8	54	4.3	114	9.0	174	13.8
55	11 43.8	11 45.7	11 11.7	55	4.3	115	8.9	175	13.6	55	11 58.8	12 00.7	11 26.0	55	4.4	115	9.1	175	13.9
56	11 44.0	11 45.9	11 11.9	56	4.3	116	9.0	176	13.6	56	11 59.0	12 01.0	11 26.2	56	4.4	116	9.2	176	13.9
57	11 44.3	11 46.2	11 12.2	57	4.4	117	9.1	177	13.7	57	11 59.3	12 01.2	11 26.5	57	4.5	117	9.3	177	14.0
58	11 44.5	11 46.4	11 12.4	58	4.5	118	9.1	178	13.8	58	11 59.5	12 01.5	11 26.7	58	4.6	118	9.3	178	14.1
59	11 44.8	11 46.7	11 12.6	59	4.6	119	9.2	179	13.9	59	11 59.8	12 01.7	11 27.0	59	4.7	119	9.4	179	14.2
60	11 45.0	11 46.9	11 12.9	60	4.7	120	9.3	180	14.0	60	12 00.0	12 02.0	11 27.2	60	4.8				

Sec.	SUN PLANET	☿	MOON	code corr'n	code corr'n	code corr'n
0	12 00.0	12 02.0	11 27.2	0 0.0	60 4.9	120 9.7
1	12 00.3	12 02.2	11 27.4	1 0.1	61 4.9	121 9.8
2	12 00.5	12 02.5	11 27.7	2 0.2	62 5.0	122 9.9
3	12 00.8	12 02.7	11 27.9	3 0.2	63 5.1	123 9.9
4	12 01.0	12 03.0	11 28.2	4 0.3	64 5.2	124 10.0
5	12 01.3	12 03.2	11 28.4	5 0.4	65 5.3	125 10.1
6	12 01.5	12 03.5	11 28.6	6 0.5	66 5.3	126 10.2
7	12 01.8	12 03.7	11 28.9	7 0.6	67 5.4	127 10.3
8	12 02.0	12 04.0	11 29.1	8 0.6	68 5.5	128 10.3
9	12 02.3	12 04.2	11 29.3	9 0.7	69 5.6	129 10.4
10	12 02.5	12 04.5	11 29.6	10 0.8	70 5.7	130 10.5
11	12 02.8	12 04.7	11 29.8	11 0.9	71 5.7	131 10.6
12	12 03.0	12 05.0	11 30.1	12 1.0	72 5.8	132 10.7
13	12 03.3	12 05.2	11 30.3	13 1.1	73 5.9	133 10.8
14	12 03.5	12 05.5	11 30.5	14 1.1	74 6.0	134 10.8
15	12 03.8	12 05.7	11 30.8	15 1.2	75 6.1	135 10.9
16	12 04.0	12 06.0	11 31.0	16 1.3	76 6.1	136 11.0
17	12 04.3	12 06.2	11 31.3	17 1.4	77 6.2	137 11.1
18	12 04.5	12 06.5	11 31.5	18 1.5	78 6.3	138 11.2
19	12 04.8	12 06.7	11 31.7	19 1.5	79 6.4	139 11.2
20	12 05.0	12 07.0	11 32.0	20 1.6	80 6.5	140 11.3
21	12 05.3	12 07.2	11 32.2	21 1.7	81 6.5	141 11.4
22	12 05.5	12 07.5	11 32.4	22 1.8	82 6.6	142 11.5
23	12 05.8	12 07.7	11 32.7	23 1.9	83 6.7	143 11.6
24	12 06.0	12 08.0	11 32.9	24 1.9	84 6.8	144 11.6
25	12 06.3	12 08.2	11 33.2	25 2.0	85 6.9	145 11.7
26	12 06.5	12 08.5	11 33.4	26 2.1	86 7.0	146 11.8
27	12 06.8	12 08.7	11 33.6	27 2.2	87 7.0	147 11.9
28	12 07.0	12 09.0	11 33.9	28 2.3	88 7.1	148 12.0
29	12 07.3	12 09.2	11 34.1	29 2.3	89 7.2	149 12.0
30	12 07.5	12 09.5	11 34.4	30 2.4	90 7.3	150 12.1
31	12 07.8	12 09.7	11 34.6	31 2.5	91 7.4	151 12.2
32	12 08.0	12 10.0	11 34.8	32 2.6	92 7.4	152 12.3
33	12 08.3	12 10.2	11 35.1	33 2.7	93 7.5	153 12.4
34	12 08.5	12 10.5	11 35.3	34 2.7	94 7.6	154 12.4
35	12 08.8	12 10.7	11 35.6	35 2.8	95 7.7	155 12.5
36	12 09.0	12 11.0	11 35.8	36 2.9	96 7.8	156 12.6
37	12 09.3	12 11.2	11 36.0	37 3.0	97 7.8	157 12.7
38	12 09.5	12 11.5	11 36.3	38 3.1	98 7.9	158 12.8
39	12 09.8	12 11.7	11 36.5	39 3.2	99 8.0	159 12.9
40	12 10.0	12 12.0	11 36.7	40 3.2	100 8.1	160 12.9
41	12 10.3	12 12.2	11 37.0	41 3.3	101 8.2	161 13.0
42	12 10.5	12 12.5	11 37.2	42 3.4	102 8.2	162 13.1
43	12 10.8	12 12.8	11 37.5	43 3.5	103 8.3	163 13.2
44	12 11.0	12 13.0	11 37.7	44 3.6	104 8.4	164 13.3
45	12 11.3	12 13.3	11 37.9	45 3.6	105 8.5	165 13.3
46	12 11.5	12 13.5	11 38.2	46 3.7	106 8.6	166 13.4
47	12 11.8	12 13.8	11 38.4	47 3.8	107 8.6	167 13.5
48	12 12.0	12 14.0	11 38.7	48 3.9	108 8.7	168 13.6
49	12 12.3	12 14.3	11 38.9	49 4.0	109 8.8	169 13.7
50	12 12.5	12 14.5	11 39.1	50 4.0	110 8.9	170 13.7
51	12 12.8	12 14.8	11 39.4	51 4.1	111 9.0	171 13.8
52	12 13.0	12 15.0	11 39.6	52 4.2	112 9.1	172 13.9
53	12 13.3	12 15.3	11 39.8	53 4.3	113 9.1	173 14.0
54	12 13.5	12 15.5	11 40.1	54 4.4	114 9.2	174 14.1
55	12 13.8	12 15.8	11 40.3	55 4.4	115 9.3	175 14.1
56	12 14.0	12 16.0	11 40.6	56 4.5	116 9.4	176 14.2
57	12 14.3	12 16.3	11 40.8	57 4.6	117 9.5	177 14.3
58	12 14.5	12 16.5	11 41.0	58 4.7	118 9.5	178 14.4
59	12 14.8	12 16.8	11 41.3	59 4.8	119 9.6	179 14.5
60	12 15.0	12 17.0	11 41.5	60 4.9	120 9.7	180 14.6

Sec.	SUN PLANET	☿	MOON	code corr'n	code corr'n	code corr'n
0	12 15.0	12 17.0	11 41.5	0 0.0	60 5.0	120 9.9
1	12 15.3	12 17.3	11 41.8	1 0.1	61 5.0	121 10.0
2	12 15.5	12 17.5	11 42.0	2 0.2	62 5.1	122 10.1
3	12 15.8	12 17.8	11 42.2	3 0.2	63 5.2	123 10.1
4	12 16.0	12 18.0	11 42.5	4 0.3	64 5.3	124 10.2
5	12 16.3	12 18.3	11 42.7	5 0.4	65 5.4	125 10.3
6	12 16.5	12 18.5	11 42.9	6 0.5	66 5.4	126 10.4
7	12 16.8	12 18.8	11 43.2	7 0.6	67 5.5	127 10.5
8	12 17.0	12 19.0	11 43.4	8 0.7	68 5.6	128 10.6
9	12 17.3	12 19.3	11 43.7	9 0.7	69 5.7	129 10.6
10	12 17.5	12 19.5	11 43.9	10 0.8	70 5.8	130 10.7
11	12 17.8	12 19.8	11 44.1	11 0.9	71 5.9	131 10.8
12	12 18.0	12 20.0	11 44.4	12 1.0	72 5.9	132 10.9
13	12 18.3	12 20.3	11 44.6	13 1.1	73 6.0	133 11.0
14	12 18.5	12 20.5	11 44.9	14 1.2	74 6.1	134 11.1
15	12 18.8	12 20.8	11 45.1	15 1.2	75 6.2	135 11.1
16	12 19.0	12 21.0	11 45.3	16 1.3	76 6.3	136 11.2
17	12 19.3	12 21.3	11 45.6	17 1.4	77 6.4	137 11.3
18	12 19.5	12 21.5	11 45.8	18 1.5	78 6.4	138 11.4
19	12 19.8	12 21.8	11 46.1	19 1.6	79 6.5	139 11.5
20	12 20.0	12 22.0	11 46.3	20 1.7	80 6.6	140 11.6
21	12 20.3	12 22.3	11 46.5	21 1.7	81 6.7	141 11.6
22	12 20.5	12 22.5	11 46.8	22 1.8	82 6.8	142 11.7
23	12 20.8	12 22.8	11 47.0	23 1.9	83 6.8	143 11.8
24	12 21.0	12 23.0	11 47.2	24 2.0	84 6.9	144 11.9
25	12 21.3	12 23.3	11 47.5	25 2.1	85 7.0	145 12.0
26	12 21.5	12 23.5	11 47.7	26 2.1	86 7.1	146 12.0
27	12 21.8	12 23.8	11 48.0	27 2.2	87 7.2	147 12.1
28	12 22.0	12 24.0	11 48.2	28 2.3	88 7.3	148 12.2
29	12 22.3	12 24.3	11 48.4	29 2.4	89 7.3	149 12.3
30	12 22.5	12 24.5	11 48.7	30 2.5	90 7.4	150 12.4
31	12 22.8	12 24.8	11 48.9	31 2.6	91 7.5	151 12.5
32	12 23.0	12 25.0	11 49.2	32 2.6	92 7.6	152 12.5
33	12 23.3	12 25.3	11 49.4	33 2.7	93 7.7	153 12.6
34	12 23.5	12 25.5	11 49.6	34 2.8	94 7.8	154 12.7
35	12 23.8	12 25.8	11 49.9	35 2.9	95 7.8	155 12.8
36	12 24.0	12 26.0	11 50.1	36 3.0	96 7.9	156 12.9
37	12 24.3	12 26.3	11 50.3	37 3.1	97 8.0	157 13.0
38	12 24.5	12 26.5	11 50.6	38 3.1	98 8.1	158 13.0
39	12 24.8	12 26.8	11 50.8	39 3.2	99 8.2	159 13.1
40	12 25.0	12 27.0	11 51.1	40 3.3	100 8.3	160 13.2
41	12 25.3	12 27.3	11 51.3	41 3.4	101 8.3	161 13.3
42	12 25.5	12 27.5	11 51.5	42 3.5	102 8.4	162 13.4
43	12 25.8	12 27.8	11 51.8	43 3.5	103 8.5	163 13.4
44	12 26.0	12 28.0	11 52.0	44 3.6	104 8.6	164 13.5
45	12 26.3	12 28.3	11 52.3	45 3.7	105 8.7	165 13.6
46	12 26.5	12 28.5	11 52.5	46 3.8	106 8.7	166 13.7
47	12 26.8	12 28.8	11 52.7	47 3.9	107 8.8	167 13.8
48	12 27.0	12 29.0	11 53.0	48 4.0	108 8.9	168 13.9
49	12 27.3	12 29.3	11 53.2	49 4.0	109 9.0	169 13.9
50	12 27.5	12 29.5	11 53.4	50 4.1	110 9.1	170 14.0
51	12 27.8	12 29.8	11 53.7	51 4.2	111 9.2	171 14.1
52	12 28.0	12 30.0	11 53.9	52 4.3	112 9.2	172 14.2
53	12 28.3	12 30.3	11 54.2	53 4.4	113 9.3	173 14.3
54	12 28.5	12 30.5	11 54.4	54 4.5	114 9.4	174 14.4
55	12 28.8	12 30.8	11 54.6	55 4.5	115 9.5	175 14.4
56	12 29.0	12 31.1	11 54.9	56 4.6	116 9.6	176 14.5
57	12 29.3	12 31.3	11 55.1	57 4.7	117 9.7	177 14.6
58	12 29.5	12 31.6	11 55.4	58 4.8	118 9.7	178 14.7
59	12 29.8	12 31.8	11 55.6	59 4.9	119 9.8	179 14.8
60	12 30.0	12 32.1	11 55.8	60 5.0	120 9.9	180 14.9

Sec.	SUN PLANET	°	MOON	code	corr'n	code	corr'n	code	corr'n	Sec.	SUN PLANET	°	MOON	code	corr'n	code	corr'n	code	corr'n
0	12 30.0	12 32.1	11 55.8	0	0.0	60	5.1	120	10.1	0	12 45.0	12 47.1	12 10.2	0	0.0	60	5.2	120	10.3
1	12 30.3	12 32.3	11 56.1	1	0.1	61	5.1	121	10.2	1	12 45.3	12 47.3	12 10.4	1	0.1	61	5.2	121	10.4
2	12 30.5	12 32.6	11 56.3	2	0.2	62	5.2	122	10.3	2	12 45.5	12 47.6	12 10.6	2	0.2	62	5.3	122	10.5
3	12 30.8	12 32.8	11 56.5	3	0.3	63	5.3	123	10.4	3	12 45.8	12 47.8	12 10.9	3	0.3	63	5.4	123	10.6
4	12 31.0	12 33.1	11 56.8	4	0.3	64	5.4	124	10.4	4	12 46.0	12 48.1	12 11.1	4	0.3	64	5.5	124	10.6
5	12 31.3	12 33.3	11 57.0	5	0.4	65	5.5	125	10.5	5	12 46.3	12 48.3	12 11.3	5	0.4	65	5.6	125	10.7
6	12 31.5	12 33.6	11 57.3	6	0.5	66	5.6	126	10.6	6	12 46.5	12 48.6	12 11.6	6	0.5	66	5.7	126	10.8
7	12 31.8	12 33.8	11 57.5	7	0.6	67	5.6	127	10.7	7	12 46.8	12 48.8	12 11.8	7	0.6	67	5.8	127	10.9
8	12 32.0	12 34.1	11 57.7	8	0.7	68	5.7	128	10.8	8	12 47.0	12 49.1	12 12.1	8	0.7	68	5.8	128	11.0
9	12 32.3	12 34.3	11 58.0	9	0.8	69	5.8	129	10.9	9	12 47.3	12 49.4	12 12.3	9	0.8	69	5.9	129	11.1
10	12 32.5	12 34.6	11 58.2	10	0.8	70	5.9	130	10.9	10	12 47.5	12 49.6	12 12.5	10	0.9	70	6.0	130	11.2
11	12 32.8	12 34.8	11 58.5	11	0.9	71	6.0	131	11.0	11	12 47.8	12 49.9	12 12.8	11	0.9	71	6.1	131	11.2
12	12 33.0	12 35.1	11 58.7	12	1.0	72	6.1	132	11.1	12	12 48.0	12 50.1	12 13.0	12	1.0	72	6.2	132	11.3
13	12 33.3	12 35.3	11 58.9	13	1.1	73	6.1	133	11.2	13	12 48.3	12 50.4	12 13.3	13	1.1	73	6.3	133	11.4
14	12 33.5	12 35.6	11 59.2	14	1.2	74	6.2	134	11.3	14	12 48.5	12 50.6	12 13.5	14	1.2	74	6.4	134	11.5
15	12 33.8	12 35.8	11 59.4	15	1.3	75	6.3	135	11.4	15	12 48.8	12 50.9	12 13.7	15	1.3	75	6.4	135	11.6
16	12 34.0	12 36.1	11 59.7	16	1.3	76	6.4	136	11.4	16	12 49.0	12 51.1	12 14.0	16	1.4	76	6.5	136	11.7
17	12 34.3	12 36.3	11 59.9	17	1.4	77	6.5	137	11.5	17	12 49.3	12 51.4	12 14.2	17	1.5	77	6.6	137	11.8
18	12 34.5	12 36.6	12 00.1	18	1.5	78	6.6	138	11.6	18	12 49.5	12 51.6	12 14.4	18	1.5	78	6.7	138	11.8
19	12 34.8	12 36.8	12 00.4	19	1.6	79	6.6	139	11.7	19	12 49.8	12 51.9	12 14.7	19	1.6	79	6.8	139	11.9
20	12 35.0	12 37.1	12 00.6	20	1.7	80	6.7	140	11.8	20	12 50.0	12 52.1	12 14.9	20	1.7	80	6.9	140	12.0
21	12 35.3	12 37.3	12 00.8	21	1.8	81	6.8	141	11.9	21	12 50.3	12 52.4	12 15.2	21	1.8	81	7.0	141	12.1
22	12 35.5	12 37.6	12 01.1	22	1.9	82	6.9	142	12.0	22	12 50.5	12 52.6	12 15.4	22	1.9	82	7.0	142	12.2
23	12 35.8	12 37.8	12 01.3	23	1.9	83	7.0	143	12.0	23	12 50.8	12 52.9	12 15.6	23	2.0	83	7.1	143	12.3
24	12 36.0	12 38.1	12 01.6	24	2.0	84	7.1	144	12.1	24	12 51.0	12 53.1	12 15.9	24	2.1	84	7.2	144	12.4
25	12 36.3	12 38.3	12 01.8	25	2.1	85	7.2	145	12.2	25	12 51.3	12 53.4	12 16.1	25	2.1	85	7.3	145	12.4
26	12 36.5	12 38.6	12 02.0	26	2.2	86	7.2	146	12.3	26	12 51.5	12 53.6	12 16.4	26	2.2	86	7.4	146	12.5
27	12 36.8	12 38.8	12 02.3	27	2.3	87	7.3	147	12.4	27	12 51.8	12 53.9	12 16.6	27	2.3	87	7.5	147	12.6
28	12 37.0	12 39.1	12 02.5	28	2.4	88	7.4	148	12.5	28	12 52.0	12 54.1	12 16.8	28	2.4	88	7.6	148	12.7
29	12 37.3	12 39.3	12 02.8	29	2.4	89	7.5	149	12.5	29	12 52.3	12 54.4	12 17.1	29	2.5	89	7.6	149	12.8
30	12 37.5	12 39.6	12 03.0	30	2.5	90	7.6	150	12.6	30	12 52.5	12 54.6	12 17.3	30	2.6	90	7.7	150	12.9
31	12 37.8	12 39.8	12 03.2	31	2.6	91	7.7	151	12.7	31	12 52.8	12 54.9	12 17.5	31	2.7	91	7.8	151	13.0
32	12 38.0	12 40.1	12 03.5	32	2.7	92	7.7	152	12.8	32	12 53.0	12 55.1	12 17.8	32	2.7	92	7.9	152	13.0
33	12 38.3	12 40.3	12 03.7	33	2.8	93	7.8	153	12.9	33	12 53.3	12 55.4	12 18.0	33	2.8	93	8.0	153	13.1
34	12 38.5	12 40.6	12 03.9	34	2.9	94	7.9	154	13.0	34	12 53.5	12 55.6	12 18.3	34	2.9	94	8.1	154	13.2
35	12 38.8	12 40.8	12 04.2	35	2.9	95	8.0	155	13.0	35	12 53.8	12 55.9	12 18.5	35	3.0	95	8.2	155	13.3
36	12 39.0	12 41.1	12 04.4	36	3.0	96	8.1	156	13.1	36	12 54.0	12 56.1	12 18.7	36	3.1	96	8.2	156	13.4
37	12 39.3	12 41.3	12 04.7	37	3.1	97	8.2	157	13.2	37	12 54.3	12 56.4	12 19.0	37	3.2	97	8.3	157	13.5
38	12 39.5	12 41.6	12 04.9	38	3.2	98	8.2	158	13.3	38	12 54.5	12 56.6	12 19.2	38	3.3	98	8.4	158	13.6
39	12 39.8	12 41.8	12 05.1	39	3.3	99	8.3	159	13.4	39	12 54.8	12 56.9	12 19.5	39	3.3	99	8.5	159	13.6
40	12 40.0	12 42.1	12 05.4	40	3.4	100	8.4	160	13.5	40	12 55.0	12 57.1	12 19.7	40	3.4	100	8.6	160	13.7
41	12 40.3	12 42.3	12 05.6	41	3.5	101	8.5	161	13.6	41	12 55.3	12 57.4	12 19.9	41	3.5	101	8.7	161	13.8
42	12 40.5	12 42.6	12 05.9	42	3.5	102	8.6	162	13.6	42	12 55.5	12 57.6	12 20.2	42	3.6	102	8.8	162	13.9
43	12 40.8	12 42.8	12 06.1	43	3.6	103	8.7	163	13.7	43	12 55.8	12 57.9	12 20.4	43	3.7	103	8.8	163	14.0
44	12 41.0	12 43.1	12 06.3	44	3.7	104	8.8	164	13.8	44	12 56.0	12 58.1	12 20.6	44	3.8	104	8.9	164	14.1
45	12 41.3	12 43.3	12 06.6	45	3.8	105	8.8	165	13.9	45	12 56.3	12 58.4	12 20.9	45	3.9	105	9.0	165	14.2
46	12 41.5	12 43.6	12 06.8	46	3.9	106	8.9	166	14.0	46	12 56.5	12 58.6	12 21.1	46	3.9	106	9.1	166	14.2
47	12 41.8	12 43.8	12 07.0	47	4.0	107	9.0	167	14.1	47	12 56.8	12 58.9	12 21.4	47	4.0	107	9.2	167	14.3
48	12 42.0	12 44.1	12 07.3	48	4.0	108	9.1	168	14.1	48	12 57.0	12 59.1	12 21.6	48	4.1	108	9.3	168	14.4
49	12 42.3	12 44.3	12 07.5	49	4.1	109	9.2	169	14.2	49	12 57.3	12 59.4	12 21.8	49	4.2	109	9.4	169	14.5
50	12 42.5	12 44.6	12 07.8	50	4.2	110	9.3	170	14.3	50	12 57.5	12 59.6	12 22.1	50	4.3	110	9.4	170	14.6
51	12 42.8	12 44.8	12 08.0	51	4.3	111	9.3	171	14.4	51	12 57.8	12 59.9	12 22.3	51	4.4	111	9.5	171	14.7
52	12 43.0	12 45.1	12 08.2	52	4.4	112	9.4	172	14.5	52	12 58.0	13 00.1	12 22.6	52	4.5	112	9.6	172	14.8
53	12 43.3	12 45.3	12 08.5	53	4.5	113	9.5	173	14.6	53	12 58.3	13 00.4	12 22.8	53	4.5	113	9.7	173	14.8
54	12 43.5	12 45.6	12 08.7	54	4.5	114	9.6	174	14.6	54	12 58.5	13 00.6	12 23.0	54	4.6	114	9.8	174	14.9
55	12 43.8	12 45.8	12 09.0	55	4.6	115	9.7	175	14.7	55	12 58.8	13 00.9	12 23.3	55	4.7	115	9.9	175	15.0
56	12 44.0	12 46.1	12 09.2	56	4.7	116	9.8	176	14.8	56	12 59.0	13 01.1	12 23.5	56	4.8	116	10.0	176	15.1
57	12 44.3	12 46.3	12 09.4	57	4.8	117	9.8	177	14.9	57	12 59.3	13 01.4	12 23.8	57	4.9	117	10.0	177	15.2
58	12 44.5	12 46.6	12 09.7	58	4.9	118	9.9	178	15.0	58	12 59.5	13 01.6	12 24.0	58	5.0	118	10.1	178	15.3
59	12 44.8	12 46.8	12 09.9	59	5.0	119	10.0	179	15.1	59	12 59.8	13 01.9	12 24.2	59	5.1	119	10.2	179	15.4
60	12 45.0	12 47.1	12 10.2	60	5.1	120	10.1	180	15.2	60	13 00.0	13 02.1	12 24.5	60	5.2	120	10.3	180	15.5

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550	551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575	576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600	601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625	626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650	651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675	676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700	701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725	726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750	751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775	776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840	841	842	843	844	845	846	847	848	849	850	851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875	876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900	901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950	951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975	976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000
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Sec.	SUN PLANET	☿	MOON	code	corr'n	code	corr'n	code	corr'n	Sec.	SUN PLANET	☿	MOON	code	corr'n	code	corr'n	code	corr'n
0	13 30.0	13 32.2	12 53.1	0	0.0	60	5.5	120	10.9	0	13 45.0	13 47.3	13 07.4	0	0.0	60	5.6	120	11.1
1	13 30.3	13 32.5	12 53.3	1	0.1	61	5.5	121	11.0	1	13 45.3	13 47.5	13 07.7	1	0.1	61	5.6	121	11.2
2	13 30.5	13 32.7	12 53.6	2	0.2	62	5.6	122	11.1	2	13 45.5	13 47.8	13 07.9	2	0.2	62	5.7	122	11.3
3	13 30.8	13 33.0	12 53.8	3	0.3	63	5.7	123	11.2	3	13 45.8	13 48.0	13 08.1	3	0.3	63	5.8	123	11.4
4	13 31.0	13 33.2	12 54.1	4	0.4	64	5.8	124	11.3	4	13 46.0	13 48.3	13 08.4	4	0.4	64	5.9	124	11.5
5	13 31.3	13 33.5	12 54.3	5	0.5	65	5.9	125	11.4	5	13 46.3	13 48.5	13 08.6	5	0.5	65	6.0	125	11.6
6	13 31.5	13 33.7	12 54.5	6	0.5	66	6.0	126	11.4	6	13 46.5	13 48.8	13 08.8	6	0.6	66	6.1	126	11.7
7	13 31.8	13 34.0	12 54.8	7	0.6	67	6.1	127	11.5	7	13 46.8	13 49.0	13 09.1	7	0.6	67	6.2	127	11.7
8	13 32.0	13 34.2	12 55.0	8	0.7	68	6.2	128	11.6	8	13 47.0	13 49.3	13 09.3	8	0.7	68	6.3	128	11.8
9	13 32.3	13 34.5	12 55.2	9	0.8	69	6.3	129	11.7	9	13 47.3	13 49.5	13 09.6	9	0.8	69	6.4	129	11.9
10	13 32.5	13 34.7	12 55.5	10	0.9	70	6.4	130	11.8	10	13 47.5	13 49.8	13 09.8	10	0.9	70	6.5	130	12.0
11	13 32.8	13 35.0	12 55.7	11	1.0	71	6.4	131	11.9	11	13 47.8	13 50.0	13 10.0	11	1.0	71	6.6	131	12.1
12	13 33.0	13 35.2	12 56.0	12	1.1	72	6.5	132	12.0	12	13 48.0	13 50.3	13 10.3	12	1.1	72	6.7	132	12.2
13	13 33.3	13 35.5	12 56.2	13	1.2	73	6.6	133	12.1	13	13 48.3	13 50.5	13 10.5	13	1.2	73	6.8	133	12.3
14	13 33.5	13 35.7	12 56.4	14	1.3	74	6.7	134	12.2	14	13 48.5	13 50.8	13 10.8	14	1.3	74	6.8	134	12.4
15	13 33.8	13 36.0	12 56.7	15	1.4	75	6.8	135	12.3	15	13 48.8	13 51.0	13 11.0	15	1.4	75	6.9	135	12.5
16	13 34.0	13 36.2	12 56.9	16	1.5	76	6.9	136	12.4	16	13 49.0	13 51.3	13 11.2	16	1.5	76	7.0	136	12.6
17	13 34.3	13 36.5	12 57.2	17	1.5	77	7.0	137	12.4	17	13 49.3	13 51.5	13 11.5	17	1.6	77	7.1	137	12.7
18	13 34.5	13 36.7	12 57.4	18	1.6	78	7.1	138	12.5	18	13 49.5	13 51.8	13 11.7	18	1.7	78	7.2	138	12.8
19	13 34.8	13 37.0	12 57.6	19	1.7	79	7.2	139	12.6	19	13 49.8	13 52.0	13 12.0	19	1.8	79	7.3	139	12.9
20	13 35.0	13 37.2	12 57.9	20	1.8	80	7.3	140	12.7	20	13 50.0	13 52.3	13 12.2	20	1.9	80	7.4	140	13.0
21	13 35.3	13 37.5	12 58.1	21	1.9	81	7.4	141	12.8	21	13 50.3	13 52.5	13 12.4	21	1.9	81	7.5	141	13.0
22	13 35.5	13 37.7	12 58.3	22	2.0	82	7.4	142	12.9	22	13 50.5	13 52.8	13 12.7	22	2.0	82	7.6	142	13.1
23	13 35.8	13 38.0	12 58.6	23	2.1	83	7.5	143	13.0	23	13 50.8	13 53.0	13 12.9	23	2.1	83	7.7	143	13.2
24	13 36.0	13 38.2	12 58.8	24	2.2	84	7.6	144	13.1	24	13 51.0	13 53.3	13 13.1	24	2.2	84	7.8	144	13.3
25	13 36.3	13 38.5	12 59.1	25	2.3	85	7.7	145	13.2	25	13 51.3	13 53.5	13 13.4	25	2.3	85	7.9	145	13.4
26	13 36.5	13 38.7	12 59.3	26	2.4	86	7.8	146	13.3	26	13 51.5	13 53.8	13 13.6	26	2.4	86	8.0	146	13.5
27	13 36.8	13 39.0	12 59.5	27	2.5	87	7.9	147	13.4	27	13 51.8	13 54.0	13 13.9	27	2.5	87	8.0	147	13.6
28	13 37.0	13 39.2	12 59.8	28	2.5	88	8.0	148	13.4	28	13 52.0	13 54.3	13 14.1	28	2.6	88	8.1	148	13.7
29	13 37.3	13 39.5	13 00.0	29	2.6	89	8.1	149	13.5	29	13 52.3	13 54.5	13 14.3	29	2.7	89	8.2	149	13.8
30	13 37.5	13 39.7	13 00.3	30	2.7	90	8.2	150	13.6	30	13 52.5	13 54.8	13 14.6	30	2.8	90	8.3	150	13.9
31	13 37.8	13 40.0	13 00.5	31	2.8	91	8.3	151	13.7	31	13 52.8	13 55.0	13 14.8	31	2.9	91	8.4	151	14.0
32	13 38.0	13 40.2	13 00.7	32	2.9	92	8.4	152	13.8	32	13 53.0	13 55.3	13 15.1	32	3.0	92	8.5	152	14.1
33	13 38.3	13 40.5	13 01.0	33	3.0	93	8.4	153	13.9	33	13 53.3	13 55.5	13 15.3	33	3.1	93	8.6	153	14.2
34	13 38.5	13 40.7	13 01.2	34	3.1	94	8.5	154	14.0	34	13 53.5	13 55.8	13 15.5	34	3.1	94	8.7	154	14.2
35	13 38.8	13 41.0	13 01.5	35	3.2	95	8.6	155	14.1	35	13 53.8	13 56.0	13 15.8	35	3.2	95	8.8	155	14.3
36	13 39.0	13 41.2	13 01.7	36	3.3	96	8.7	156	14.2	36	13 54.0	13 56.3	13 16.0	36	3.3	96	8.9	156	14.4
37	13 39.3	13 41.5	13 01.9	37	3.4	97	8.8	157	14.3	37	13 54.3	13 56.5	13 16.2	37	3.4	97	9.0	157	14.5
38	13 39.5	13 41.7	13 02.2	38	3.5	98	8.9	158	14.4	38	13 54.5	13 56.8	13 16.5	38	3.5	98	9.1	158	14.6
39	13 39.8	13 42.0	13 02.4	39	3.5	99	9.0	159	14.4	39	13 54.8	13 57.0	13 16.7	39	3.6	99	9.2	159	14.7
40	13 40.0	13 42.2	13 02.6	40	3.6	100	9.1	160	14.5	40	13 55.0	13 57.3	13 17.0	40	3.7	100	9.3	160	14.8
41	13 40.3	13 42.5	13 02.9	41	3.7	101	9.2	161	14.6	41	13 55.3	13 57.5	13 17.2	41	3.8	101	9.3	161	14.9
42	13 40.5	13 42.7	13 03.1	42	3.8	102	9.3	162	14.7	42	13 55.5	13 57.8	13 17.4	42	3.9	102	9.4	162	15.0
43	13 40.8	13 43.0	13 03.4	43	3.9	103	9.4	163	14.8	43	13 55.8	13 58.0	13 17.7	43	4.0	103	9.5	163	15.1
44	13 41.0	13 43.2	13 03.6	44	4.0	104	9.4	164	14.9	44	13 56.0	13 58.3	13 17.9	44	4.1	104	9.6	164	15.2
45	13 41.3	13 43.5	13 03.8	45	4.1	105	9.5	165	15.0	45	13 56.3	13 58.5	13 18.2	45	4.2	105	9.7	165	15.3
46	13 41.5	13 43.7	13 04.1	46	4.2	106	9.6	166	15.1	46	13 56.5	13 58.8	13 18.4	46	4.3	106	9.8	166	15.4
47	13 41.8	13 44.0	13 04.3	47	4.3	107	9.7	167	15.2	47	13 56.8	13 59.0	13 18.6	47	4.3	107	9.9	167	15.4
48	13 42.0	13 44.3	13 04.6	48	4.4	108	9.8	168	15.3	48	13 57.0	13 59.3	13 18.9	48	4.4	108	10.0	168	15.5
49	13 42.3	13 44.5	13 04.8	49	4.5	109	9.9	169	15.4	49	13 57.3	13 59.5	13 19.1	49	4.5	109	10.1	169	15.6
50	13 42.5	13 44.8	13 05.0	50	4.5	110	10.0	170	15.4	50	13 57.5	13 59.8	13 19.3	50	4.6	110	10.2	170	15.7
51	13 42.8	13 45.0	13 05.3	51	4.6	111	10.1	171	15.5	51	13 57.8	14 00.0	13 19.6	51	4.7	111	10.3	171	15.8
52	13 43.0	13 45.3	13 05.5	52	4.7	112	10.2	172	15.6	52	13 58.0	14 00.3	13 19.8	52	4.8	112	10.4	172	15.9
53	13 43.3	13 45.5	13 05.7	53	4.8	113	10.3	173	15.7	53	13 58.3	14 00.5	13 20.1	53	4.9	113	10.5	173	16.0
54	13 43.5	13 45.8	13 06.0	54	4.9	114	10.4	174	15.8	54	13 58.5	14 00.8	13 20.3	54	5.0	114	10.5	174	16.1
55	13 43.8	13 46.0	13 06.2	55	5.0	115	10.4	175	15.9	55	13 58.8	14 01.0	13 20.5	55	5.1	115	10.6	175	16.2
56	13 44.0	13 46.3	13 06.5	56	5.1	116	10.5	176	16.0	56	13 59.0	14 01.3	13 20.8	56	5.2	116	10.7	176	16.3
57	13 44.3	13 46.5	13 06.7	57	5.2	117	10.6	177	16.1	57	13 59.3	14 01.5	13 21.0	57	5.3	117	10.8	177	16.4
58	13 44.5	13 46.8	13 06.9	58	5.3	118	10.7	178	16.2	58	13 59.5	14 01.8	13 21.3	58	5.4	118	10.9	178	16.5
59	13 44.8	13 47.0	13 07.2	59	5.4	119	10.8	179	16.3	59	13 59.8	14 02.0	13 21.5	59	5.5	119	11.0	179	16.6
60	13 45.0	13 47.3	13 07.4	60	5.5	120	10.9	180	16.4	60	14 00.0	14 02.3	13 21.7	60	5.6	120	11.1	180	16.7

Sec.	SUN PLANET	☿	MOON	code corr'n	code corr'n	code corr'n
0	14 00,0	14 02,3	13 21,7	0 0,0	60 5,7	120 11,3
1	14 00,3	14 02,6	13 22,0	1 0,1	61 5,7	121 11,4
2	14 00,5	14 02,8	13 22,2	2 0,2	62 5,8	122 11,5
3	14 00,8	14 03,1	13 22,4	3 0,3	63 5,9	123 11,6
4	14 01,0	14 03,3	13 22,7	4 0,4	64 6,0	124 11,7
5	14 01,3	14 03,6	13 22,9	5 0,5	65 6,1	125 11,8
6	14 01,5	14 03,8	13 23,2	6 0,6	66 6,2	126 11,9
7	14 01,8	14 04,1	13 23,4	7 0,7	67 6,3	127 12,0
8	14 02,0	14 04,3	13 23,6	8 0,8	68 6,4	128 12,1
9	14 02,3	14 04,6	13 23,9	9 0,8	69 6,5	129 12,1
10	14 02,5	14 04,8	13 24,1	10 0,9	70 6,6	130 12,2
11	14 02,8	14 05,1	13 24,4	11 1,0	71 6,7	131 12,3
12	14 03,0	14 05,3	13 24,6	12 1,1	72 6,8	132 12,4
13	14 03,3	14 05,6	13 24,8	13 1,2	73 6,9	133 12,5
14	14 03,5	14 05,8	13 25,1	14 1,3	74 7,0	134 12,6
15	14 03,8	14 06,1	13 25,3	15 1,4	75 7,1	135 12,7
16	14 04,0	14 06,3	13 25,6	16 1,5	76 7,2	136 12,8
17	14 04,3	14 06,6	13 25,8	17 1,6	77 7,3	137 12,9
18	14 04,5	14 06,8	13 26,0	18 1,7	78 7,3	138 13,0
19	14 04,8	14 07,1	13 26,3	19 1,8	79 7,4	139 13,1
20	14 05,0	14 07,3	13 26,5	20 1,9	80 7,5	140 13,2
21	14 05,3	14 07,6	13 26,7	21 2,0	81 7,6	141 13,3
22	14 05,5	14 07,8	13 27,0	22 2,1	82 7,7	142 13,4
23	14 05,8	14 08,1	13 27,2	23 2,2	83 7,8	143 13,5
24	14 06,0	14 08,3	13 27,5	24 2,3	84 7,9	144 13,6
25	14 06,3	14 08,6	13 27,7	25 2,4	85 8,0	145 13,7
26	14 06,5	14 08,8	13 27,9	26 2,4	86 8,1	146 13,7
27	14 06,8	14 09,1	13 28,2	27 2,5	87 8,2	147 13,8
28	14 07,0	14 09,3	13 28,4	28 2,6	88 8,3	148 13,9
29	14 07,3	14 09,6	13 28,7	29 2,7	89 8,4	149 14,0
30	14 07,5	14 09,8	13 28,9	30 2,8	90 8,5	150 14,1
31	14 07,8	14 10,1	13 29,1	31 2,9	91 8,6	151 14,2
32	14 08,0	14 10,3	13 29,4	32 3,0	92 8,7	152 14,3
33	14 08,3	14 10,6	13 29,6	33 3,1	93 8,8	153 14,4
34	14 08,5	14 10,8	13 29,8	34 3,2	94 8,9	154 14,5
35	14 08,8	14 11,1	13 30,1	35 3,3	95 8,9	155 14,6
36	14 09,0	14 11,3	13 30,3	36 3,4	96 9,0	156 14,7
37	14 09,3	14 11,6	13 30,6	37 3,5	97 9,1	157 14,8
38	14 09,5	14 11,8	13 30,8	38 3,6	98 9,2	158 14,9
39	14 09,8	14 12,1	13 31,0	39 3,7	99 9,3	159 15,0
40	14 10,0	14 12,3	13 31,3	40 3,8	100 9,4	160 15,1
41	14 10,3	14 12,6	13 31,5	41 3,9	101 9,5	161 15,2
42	14 10,5	14 12,8	13 31,8	42 4,0	102 9,6	162 15,3
43	14 10,8	14 13,1	13 32,0	43 4,0	103 9,7	163 15,3
44	14 11,0	14 13,3	13 32,2	44 4,1	104 9,8	164 15,4
45	14 11,3	14 13,6	13 32,5	45 4,2	105 9,9	165 15,5
46	14 11,5	14 13,8	13 32,7	46 4,3	106 10,0	166 15,6
47	14 11,8	14 14,1	13 32,9	47 4,4	107 10,1	167 15,7
48	14 12,0	14 14,3	13 33,2	48 4,5	108 10,2	168 15,8
49	14 12,3	14 14,6	13 33,4	49 4,6	109 10,3	169 15,9
50	14 12,5	14 14,8	13 33,7	50 4,7	110 10,4	170 16,0
51	14 12,8	14 15,1	13 33,9	51 4,8	111 10,5	171 16,1
52	14 13,0	14 15,3	13 34,1	52 4,9	112 10,5	172 16,2
53	14 13,3	14 15,6	13 34,4	53 5,0	113 10,6	173 16,3
54	14 13,5	14 15,8	13 34,6	54 5,1	114 10,7	174 16,4
55	14 13,8	14 16,1	13 34,9	55 5,2	115 10,8	175 16,5
56	14 14,0	14 16,3	13 35,1	56 5,3	116 10,9	176 16,6
57	14 14,3	14 16,6	13 35,3	57 5,4	117 11,0	177 16,7
58	14 14,5	14 16,8	13 35,6	58 5,5	118 11,1	178 16,8
59	14 14,8	14 17,1	13 35,8	59 5,6	119 11,2	179 16,9
60	14 15,0	14 17,3	13 36,1	60 5,7	120 11,3	180 17,0

Sec.	SUN PLANET	☿	MOON	code corr'n	code corr'n	code corr'n
0	14 15,0	14 17,3	13 36,1	0 0,0	60 5,8	120 11,5
1	14 15,3	14 17,6	13 36,3	1 0,1	61 5,8	121 11,6
2	14 15,5	14 17,8	13 36,5	2 0,2	62 5,9	122 11,7
3	14 15,8	14 18,1	13 36,8	3 0,3	63 6,0	123 11,8
4	14 16,0	14 18,3	13 37,0	4 0,4	64 6,1	124 11,9
5	14 16,3	14 18,6	13 37,2	5 0,5	65 6,2	125 12,0
6	14 16,5	14 18,8	13 37,5	6 0,6	66 6,3	126 12,1
7	14 16,8	14 19,1	13 37,7	7 0,7	67 6,4	127 12,2
8	14 17,0	14 19,3	13 38,0	8 0,8	68 6,5	128 12,3
9	14 17,3	14 19,6	13 38,2	9 0,9	69 6,6	129 12,4
10	14 17,5	14 19,8	13 38,4	10 1,0	70 6,7	130 12,5
11	14 17,8	14 20,1	13 38,7	11 1,1	71 6,8	131 12,6
12	14 18,0	14 20,3	13 38,9	12 1,2	72 6,9	132 12,7
13	14 18,3	14 20,6	13 39,2	13 1,2	73 7,0	133 12,7
14	14 18,5	14 20,9	13 39,4	14 1,3	74 7,1	134 12,8
15	14 18,8	14 21,1	13 39,6	15 1,4	75 7,2	135 12,9
16	14 19,0	14 21,4	13 39,9	16 1,5	76 7,3	136 13,0
17	14 19,3	14 21,6	13 40,1	17 1,6	77 7,4	137 13,1
18	14 19,5	14 21,9	13 40,3	18 1,7	78 7,5	138 13,2
19	14 19,8	14 22,1	13 40,6	19 1,8	79 7,6	139 13,3
20	14 20,0	14 22,4	13 40,8	20 1,9	80 7,7	140 13,4
21	14 20,3	14 22,6	13 41,1	21 2,0	81 7,8	141 13,5
22	14 20,5	14 22,9	13 41,3	22 2,1	82 7,9	142 13,6
23	14 20,8	14 23,1	13 41,5	23 2,2	83 8,0	143 13,7
24	14 21,0	14 23,4	13 41,8	24 2,3	84 8,1	144 13,8
25	14 21,3	14 23,6	13 42,0	25 2,4	85 8,1	145 13,9
26	14 21,5	14 23,9	13 42,3	26 2,5	86 8,2	146 14,0
27	14 21,8	14 24,1	13 42,5	27 2,6	87 8,3	147 14,1
28	14 22,0	14 24,4	13 42,7	28 2,7	88 8,4	148 14,2
29	14 22,3	14 24,6	13 43,0	29 2,8	89 8,5	149 14,3
30	14 22,5	14 24,9	13 43,2	30 2,9	90 8,6	150 14,4
31	14 22,8	14 25,1	13 43,4	31 3,0	91 8,7	151 14,5
32	14 23,0	14 25,4	13 43,7	32 3,1	92 8,8	152 14,6
33	14 23,3	14 25,6	13 43,9	33 3,2	93 8,9	153 14,7
34	14 23,5	14 25,9	13 44,2	34 3,3	94 9,0	154 14,8
35	14 23,8	14 26,1	13 44,4	35 3,4	95 9,1	155 14,9
36	14 24,0	14 26,4	13 44,6	36 3,5	96 9,2	156 15,0
37	14 24,3	14 26,6	13 44,9	37 3,5	97 9,3	157 15,0
38	14 24,5	14 26,9	13 45,1	38 3,6	98 9,4	158 15,1
39	14 24,8	14 27,1	13 45,4	39 3,7	99 9,5	159 15,2
40	14 25,0	14 27,4	13 45,6	40 3,8	100 9,6	160 15,3
41	14 25,3	14 27,6	13 45,8	41 3,9	101 9,7	161 15,4
42	14 25,5	14 27,9	13 46,1	42 4,0	102 9,8	162 15,5
43	14 25,8	14 28,1	13 46,3	43 4,1	103 9,9	163 15,6
44	14 26,0	14 28,4	13 46,5	44 4,2	104 10,0	164 15,7
45	14 26,3	14 28,6	13 46,8	45 4,3	105 10,1	165 15,8
46	14 26,5	14 28,9	13 47,0	46 4,4	106 10,2	166 15,9
47	14 26,8	14 29,1	13 47,3	47 4,5	107 10,3	167 16,0
48	14 27,0	14 29,4	13 47,5	48 4,6	108 10,4	168 16,1
49	14 27,3	14 29,6	13 47,7	49 4,7	109 10,4	169 16,2
50	14 27,5	14 29,9	13 48,0	50 4,8	110 10,5	170 16,3
51	14 27,8	14 30,1	13 48,2	51 4,9	111 10,6	171 16,4
52	14 28,0	14 30,4	13 48,5	52 5,0	112 10,7	172 16,5
53	14 28,3	14 30,6	13 48,7	53 5,1	113 10,8	173 16,6
54	14 28,5	14 30,9	13 48,9	54 5,2	114 10,9	174 16,7
55	14 28,8	14 31,1	13 49,2	55 5,3	115 11,0	175 16,8
56	14 29,0	14 31,4	13 49,4	56 5,4	116 11,1	176 16,9
57	14 29,3	14 31,6	13 49,7	57 5,5	117 11,2	177 17,0
58	14 29,5	14 31,9	13 49,9	58 5,6	118 11,3	178 17,1
59	14 29,8	14 32,1	13 50,1	59 5,7	119 11,4	179 17,2
60	14 30,0	14 32,4	13 50,4	60 5,8	120 11,5	180 17,3

Sec.	SUN PLANET	☿	MOON	code corr'n	code corr'n	code corr'n	Sec.	SUN PLANET	☿	MOON	code corr'n	code corr'n	code corr'n
0	14 30.0	14 32.4	13 50.4	0 0.0	60 5.9	120 11.7	0	14 45.0	14 47.4	14 04.7	0 0.0	60 6.0	120 11.9
1	14 30.3	14 32.6	13 50.6	1 0.1	61 5.9	121 11.8	1	14 45.3	14 47.7	14 04.9	1 0.1	61 6.0	121 12.0
2	14 30.5	14 32.9	13 50.8	2 0.2	62 6.0	122 11.9	2	14 45.5	14 47.9	14 05.2	2 0.2	62 6.1	122 12.1
3	14 30.8	14 33.1	13 51.1	3 0.3	63 6.1	123 12.0	3	14 45.8	14 48.2	14 05.4	3 0.3	63 6.2	123 12.2
4	14 31.0	14 33.4	13 51.3	4 0.4	64 6.2	124 12.1	4	14 46.0	14 48.4	14 05.6	4 0.4	64 6.3	124 12.3
5	14 31.3	14 33.6	13 51.6	5 0.5	65 6.3	125 12.2	5	14 46.3	14 48.7	14 05.9	5 0.5	65 6.4	125 12.4
6	14 31.5	14 33.9	13 51.8	6 0.6	66 6.4	126 12.3	6	14 46.5	14 48.9	14 06.1	6 0.6	66 6.5	126 12.5
7	14 31.8	14 34.1	13 52.0	7 0.7	67 6.5	127 12.4	7	14 46.8	14 49.2	14 06.4	7 0.7	67 6.6	127 12.6
8	14 32.0	14 34.4	13 52.3	8 0.8	68 6.6	128 12.5	8	14 47.0	14 49.4	14 06.6	8 0.8	68 6.7	128 12.7
9	14 32.3	14 34.6	13 52.5	9 0.9	69 6.7	129 12.6	9	14 47.3	14 49.7	14 06.8	9 0.9	69 6.8	129 12.8
10	14 32.5	14 34.9	13 52.8	10 1.0	70 6.8	130 12.7	10	14 47.5	14 49.9	14 07.1	10 1.0	70 6.9	130 12.9
11	14 32.8	14 35.1	13 53.0	11 1.1	71 6.9	131 12.8	11	14 47.8	14 50.2	14 07.3	11 1.1	71 7.0	131 13.0
12	14 33.0	14 35.4	13 53.2	12 1.2	72 7.0	132 12.9	12	14 48.0	14 50.4	14 07.5	12 1.2	72 7.1	132 13.1
13	14 33.3	14 35.6	13 53.5	13 1.3	73 7.1	133 13.0	13	14 48.3	14 50.7	14 07.8	13 1.3	73 7.2	133 13.2
14	14 33.5	14 35.9	13 53.7	14 1.4	74 7.2	134 13.1	14	14 48.5	14 50.9	14 08.0	14 1.4	74 7.3	134 13.3
15	14 33.8	14 36.1	13 53.9	15 1.5	75 7.3	135 13.2	15	14 48.8	14 51.2	14 08.3	15 1.5	75 7.4	135 13.4
16	14 34.0	14 36.4	13 54.2	16 1.6	76 7.4	136 13.3	16	14 49.0	14 51.4	14 08.5	16 1.6	76 7.5	136 13.5
17	14 34.3	14 36.6	13 54.4	17 1.7	77 7.5	137 13.4	17	14 49.3	14 51.7	14 08.7	17 1.7	77 7.6	137 13.6
18	14 34.5	14 36.9	13 54.7	18 1.8	78 7.6	138 13.5	18	14 49.5	14 51.9	14 09.0	18 1.8	78 7.7	138 13.7
19	14 34.8	14 37.1	13 54.9	19 1.9	79 7.7	139 13.6	19	14 49.8	14 52.2	14 09.2	19 1.9	79 7.8	139 13.8
20	14 35.0	14 37.4	13 55.1	20 2.0	80 7.8	140 13.7	20	14 50.0	14 52.4	14 09.5	20 2.0	80 7.9	140 13.9
21	14 35.3	14 37.6	13 55.4	21 2.0	81 7.9	141 13.7	21	14 50.3	14 52.7	14 09.7	21 2.1	81 8.0	141 14.0
22	14 35.5	14 37.9	13 55.6	22 2.1	82 8.0	142 13.8	22	14 50.5	14 52.9	14 09.9	22 2.2	82 8.1	142 14.1
23	14 35.8	14 38.1	13 55.9	23 2.2	83 8.1	143 13.9	23	14 50.8	14 53.2	14 10.2	23 2.3	83 8.2	143 14.2
24	14 36.0	14 38.4	13 56.1	24 2.3	84 8.2	144 14.0	24	14 51.0	14 53.4	14 10.4	24 2.4	84 8.3	144 14.3
25	14 36.3	14 38.6	13 56.3	25 2.4	85 8.3	145 14.1	25	14 51.3	14 53.7	14 10.6	25 2.5	85 8.4	145 14.4
26	14 36.5	14 38.9	13 56.6	26 2.5	86 8.4	146 14.2	26	14 51.5	14 53.9	14 10.9	26 2.6	86 8.5	146 14.5
27	14 36.8	14 39.2	13 56.8	27 2.6	87 8.5	147 14.3	27	14 51.8	14 54.2	14 11.1	27 2.7	87 8.6	147 14.6
28	14 37.0	14 39.4	13 57.0	28 2.7	88 8.6	148 14.4	28	14 52.0	14 54.4	14 11.4	28 2.8	88 8.7	148 14.7
29	14 37.3	14 39.7	13 57.3	29 2.8	89 8.7	149 14.5	29	14 52.3	14 54.7	14 11.6	29 2.9	89 8.8	149 14.8
30	14 37.5	14 39.9	13 57.5	30 2.9	90 8.8	150 14.6	30	14 52.5	14 54.9	14 11.8	30 3.0	90 8.9	150 14.9
31	14 37.8	14 40.2	13 57.8	31 3.0	91 8.9	151 14.7	31	14 52.8	14 55.2	14 12.1	31 3.1	91 9.0	151 15.0
32	14 38.0	14 40.4	13 58.0	32 3.1	92 9.0	152 14.8	32	14 53.0	14 55.4	14 12.3	32 3.2	92 9.1	152 15.1
33	14 38.3	14 40.7	13 58.2	33 3.2	93 9.1	153 14.9	33	14 53.3	14 55.7	14 12.6	33 3.3	93 9.2	153 15.2
34	14 38.5	14 40.9	13 58.5	34 3.3	94 9.2	154 15.0	34	14 53.5	14 55.9	14 12.8	34 3.4	94 9.3	154 15.3
35	14 38.8	14 41.2	13 58.7	35 3.4	95 9.3	155 15.1	35	14 53.8	14 56.2	14 13.0	35 3.5	95 9.4	155 15.4
36	14 39.0	14 41.4	13 59.0	36 3.5	96 9.4	156 15.2	36	14 54.0	14 56.4	14 13.3	36 3.6	96 9.5	156 15.5
37	14 39.3	14 41.7	13 59.2	37 3.6	97 9.5	157 15.3	37	14 54.3	14 56.7	14 13.5	37 3.7	97 9.6	157 15.6
38	14 39.5	14 41.9	13 59.4	38 3.7	98 9.6	158 15.4	38	14 54.5	14 56.9	14 13.8	38 3.8	98 9.7	158 15.7
39	14 39.8	14 42.2	13 59.7	39 3.8	99 9.7	159 15.5	39	14 54.8	14 57.2	14 14.0	39 3.9	99 9.8	159 15.8
40	14 40.0	14 42.4	13 59.9	40 3.9	100 9.8	160 15.6	40	14 55.0	14 57.5	14 14.2	40 4.0	100 9.9	160 15.9
41	14 40.3	14 42.7	14 00.1	41 4.0	101 9.8	161 15.7	41	14 55.3	14 57.7	14 14.5	41 4.1	101 10.0	161 16.0
42	14 40.5	14 42.9	14 00.4	42 4.1	102 9.9	162 15.8	42	14 55.5	14 58.0	14 14.7	42 4.2	102 10.1	162 16.1
43	14 40.8	14 43.2	14 00.6	43 4.2	103 10.0	163 15.9	43	14 55.8	14 58.2	14 14.9	43 4.3	103 10.2	163 16.2
44	14 41.0	14 43.4	14 00.9	44 4.3	104 10.1	164 16.0	44	14 56.0	14 58.5	14 15.2	44 4.4	104 10.3	164 16.3
45	14 41.3	14 43.7	14 01.1	45 4.4	105 10.2	165 16.1	45	14 56.3	14 58.7	14 15.4	45 4.5	105 10.4	165 16.4
46	14 41.5	14 43.9	14 01.3	46 4.5	106 10.3	166 16.2	46	14 56.5	14 59.0	14 15.7	46 4.6	106 10.5	166 16.5
47	14 41.8	14 44.2	14 01.6	47 4.6	107 10.4	167 16.3	47	14 56.8	14 59.2	14 15.9	47 4.7	107 10.6	167 16.6
48	14 42.0	14 44.4	14 01.8	48 4.7	108 10.5	168 16.4	48	14 57.0	14 59.5	14 16.1	48 4.8	108 10.7	168 16.7
49	14 42.3	14 44.7	14 02.1	49 4.8	109 10.6	169 16.5	49	14 57.3	14 59.7	14 16.4	49 4.9	109 10.8	169 16.8
50	14 42.5	14 44.9	14 02.3	50 4.9	110 10.7	170 16.6	50	14 57.5	15 00.0	14 16.6	50 5.0	110 10.9	170 16.9
51	14 42.8	14 45.2	14 02.5	51 5.0	111 10.8	171 16.7	51	14 57.8	15 00.2	14 16.9	51 5.1	111 11.0	171 17.0
52	14 43.0	14 45.4	14 02.8	52 5.1	112 10.9	172 16.8	52	14 58.0	15 00.5	14 17.1	52 5.2	112 11.1	172 17.1
53	14 43.3	14 45.7	14 03.0	53 5.2	113 11.0	173 16.9	53	14 58.3	15 00.7	14 17.3	53 5.3	113 11.2	173 17.2
54	14 43.5	14 45.9	14 03.3	54 5.3	114 11.1	174 17.0	54	14 58.5	15 01.0	14 17.6	54 5.4	114 11.3	174 17.3
55	14 43.8	14 46.2	14 03.5	55 5.4	115 11.2	175 17.1	55	14 58.8	15 01.2	14 17.8	55 5.5	115 11.4	175 17.4
56	14 44.0	14 46.4	14 03.7	56 5.5	116 11.3	176 17.2	56	14 59.0	15 01.5	14 18.0	56 5.6	116 11.5	176 17.5
57	14 44.3	14 46.7	14 04.0	57 5.6	117 11.4	177 17.3	57	14 59.3	15 01.7	14 18.3	57 5.7	117 11.6	177 17.6
58	14 44.5	14 46.9	14 04.2	58 5.7	118 11.5	178 17.4	58	14 59.5	15 02.0	14 18.5	58 5.8	118 11.7	178 17.7
59	14 44.8	14 47.2	14 04.4	59 5.8	119 11.6	179 17.5	59	14 59.8	15 02.2	14 18.8	59 5.9	119 11.8	179 17.8
60	14 45.0	14 47.4	14 04.7	60 5.9	120 11.7	180 17.6	60	15 00.0	15 02.5	14 19.0	60 6.0	120 11.9	180 17.9

NAVIGATIONAL STAR CHART

The star chart assists the navigator in identifying stars. The stars of each constellation are connected by dotted lines; the 57 stars given on the daily pages are identified by their names and numbers, the 34 stars used in H. O. 249 having their names and numbers underlined, and the other navigational stars are identified by their Greek letters. The sidereal hour angle and declination of each star can be determined from the map by means of the network of vertical and horizontal lines. The SHA's are measured (0° to 360°) from the vertical line passing through the Vernal Equinox at 0° . The declinations are measured north and south ($+90^{\circ}$ to -90°) from the celestial equator which is represented by a horizontal line through the center.

The rectangular shape of the chart distorts the relative positions of the stars in the polar regions. For example the north polar region is distorted so that the pointer stars of the big dipper are not in alignment with Polaris. A globe would give a better representation, and an observer from the inside would see the constellations as they appear in the sky. Then the SHA lines would converge at the north and south poles and the equator and ecliptic would be circles.

An observer's local meridian at any given instant may be located on the chart by means of the SHA coordinates. The basic relation $GHA^* = GHA \Upsilon + SHA^*$ may be written:

$$SHA^* = GHA^* - GHA \Upsilon$$

For a star on the meridian the GHA^* is equal to the west longitude, whence

$$SHA \text{ (local meridian)} = W \text{ Long.} - GHA \Upsilon$$

East longitude may be converted into west longitude by subtracting from 360° .

Example: Locate on the chart the local meridian of an observer in longitude 110° W on Jan. 1, at 6^h GMT. From the daily page for Jan. 1, 2, 3, at 6^h, Jan. 1 the $GHA \Upsilon = 190^{\circ}$. The SHA of his meridian will therefore be $110^{\circ} + 360^{\circ} - 190^{\circ} = 280^{\circ}$.

The identification of a star directly overhead, i. e., in the zenith, is easily made since the point overhead is on the local meridian and also has a Dec. equal to the observer's latitude.

Example: Assume that the observer in the above example is in latitude 40° N and that a star in the zenith is to be identified. The SHA of the star is exactly equal to the SHA of the local meridian and was found to be 280° . The star's Dec. is $+40^{\circ}$ since the observer's latitude is equal to the Dec. of a point in the zenith.

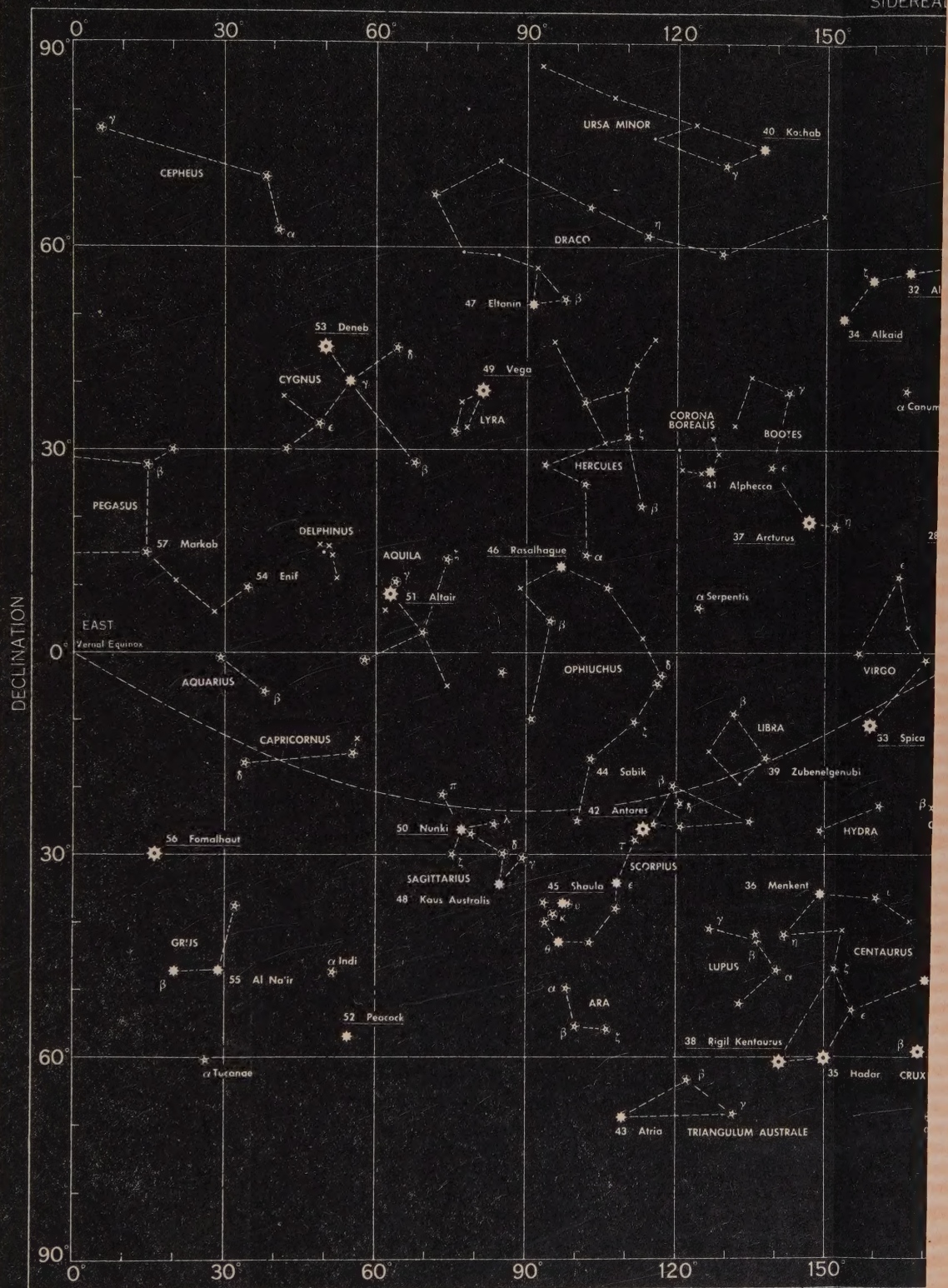
Examination of the chart in the region of $SHA = 280^{\circ}$ and $Dec. = +40^{\circ}$ shows the brightest star in the region to be the first magnitude star Capella. To verify, this region of the chart may be compared in detail with the sky. One finds the conspicuous triangle formed by the three first magnitude stars Pollux, Aldebaran, and Capella.

A star to the north or south of the zenith is easily identified because its angular distance from the zenith is equal to the difference between its declination and the observer's latitude. Thus, in the above example, Rigel (Dec. -10°) would appear about 50° south of the zenith or at an altitude of 40° .

The chart may also be used with the "Star Identification Table" in H. O. 214. The table is used to convert an observed altitude and azimuth into Dec. and LHA; the LHA is converted into SHA, and the problem becomes that of the above example, i. e., identification from SHA and Dec. The SHA may be found by adding the LHA, if west, to the SHA of the local meridian and by subtracting it if east.

The ecliptic, which is the path of the Sun among the stars, is represented on the chart by a curved dotted line. The Moon and planets remain always within a few degrees of the ecliptic.

The SHA of a planet can be found by inspection from the daily page. First find the time when the $GHA \Upsilon = 0^{\circ}$, then the GHA of any object at the corresponding time is also the SHA of that object.



AL STAR CHART

... HOUR ANGLE



CORRECTION TO OBSERVED ALTITUDE OF MOON

ADD

Obs. Alt.	0'	8'	15'	23'	30'	38'	45'	53'	60'	Obs. Alt.	0'	8'	15'	23'	30'	38'	45'	53'	60'
°										°									
1	32.6	33.6	34.5	35.3	36.1	36.9	37.6	38.2		46	38.6	38.5	38.5	38.4	38.3	38.2	38.1	38.0	
2	38.8	39.4	40.0	40.5	41.0	41.4	41.9	42.3		47	37.9	37.8	37.8	37.7	37.6	37.5	37.4	37.3	
3	42.7	43.1	43.4	43.8	44.1	44.4	44.7	45.0		48	37.2	37.1	37.1	37.0	36.9	36.8	36.7	36.6	
4	45.2	45.5	45.8	46.0	46.2	46.4	46.6	46.8		49	36.5	36.4	36.3	36.2	36.2	36.1	36.0	35.9	
5	47.0	47.2	47.4	47.6	47.7	47.9	48.0	48.2		50	35.8	35.7	35.6	35.5	35.4	35.3	35.2	35.1	
6	48.3	48.4	48.6	48.7	48.8	48.9	49.0	49.1		51	35.0	35.0	34.9	34.8	34.7	34.6	34.5	34.4	
7	49.2	49.3	49.4	49.5	49.6	49.7	49.8	49.9		52	34.3	34.2	34.1	34.0	33.9	33.8	33.7	33.6	
8	49.9	50.0	50.1	50.2	50.3	50.3	50.4	50.4		53	33.5	33.4	33.3	33.2	33.1	33.0	33.0	32.9	
9	50.5	50.5	50.6	50.6	50.7	50.7	50.8	50.8		54	32.8	32.7	32.6	32.5	32.4	32.3	32.2	32.1	
10	50.9	50.9	50.9	51.0	51.0	51.0	51.1	51.1		55	32.0	31.9	31.8	31.7	31.6	31.5	31.4	31.3	
11	51.1	51.2	51.2	51.2	51.2	51.3	51.3	51.3		56	31.2	31.1	31.0	30.9	30.8	30.7	30.6	30.5	
12	51.3	51.3	51.4	51.4	51.4	51.4	51.4	51.4		57	30.4	30.3	30.2	30.1	30.0	29.9	29.8	29.7	
13	51.4	51.5	51.5	51.5	51.5	51.5	51.5	51.5		58	29.6	29.4	29.3	29.2	29.1	29.0	28.9	28.8	
14	51.5	51.5	51.5	51.5	51.5	51.5	51.5	51.5		59	28.7	28.6	28.5	28.4	28.3	28.2	28.1	28.0	
15	51.5	51.5	51.5	51.5	51.5	51.5	51.5	51.5		60	27.9	27.8	27.7	27.6	27.5	27.4	27.3	27.2	
16	51.5	51.5	51.4	51.4	51.4	51.4	51.4	51.4		61	27.0	26.9	26.8	26.7	26.6	26.5	26.4	26.3	
17	51.4	51.4	51.4	51.3	51.3	51.3	51.3	51.3		62	26.2	26.1	26.0	25.9	25.8	25.7	25.5	25.4	
18	51.3	51.2	51.2	51.2	51.2	51.2	51.1	51.1		63	25.3	25.2	25.1	25.0	24.9	24.8	24.7	24.6	
19	51.1	51.1	51.1	51.0	51.0	51.0	51.0	50.9		64	24.5	24.4	24.2	24.1	24.0	23.9	23.8	23.7	
20	50.9	50.9	50.9	50.8	50.8	50.8	50.8	50.7		65	23.6	23.5	23.4	23.3	23.1	23.0	22.9	22.8	
21	50.7	50.7	50.6	50.6	50.6	50.6	50.5	50.5		66	22.7	22.6	22.5	22.4	22.3	22.1	22.0	21.9	
22	50.5	50.4	50.4	50.4	50.3	50.3	50.3	50.2		67	21.8	21.7	21.6	21.5	21.4	21.2	21.1	21.0	
23	50.2	50.2	50.1	50.1	50.0	50.0	50.0	49.9		68	20.9	20.8	20.7	20.6	20.5	20.3	20.2	20.1	
24	49.9	49.9	49.8	49.8	49.7	49.7	49.7	49.6		69	20.0	19.9	19.8	19.7	19.5	19.4	19.3	19.2	
25	49.6	49.5	49.5	49.5	49.4	49.4	49.3	49.3		70	19.1	19.0	18.9	18.7	18.6	18.5	18.4	18.3	
26	49.2	49.2	49.2	49.1	49.1	49.0	49.0	48.9		71	18.2	18.1	17.9	17.8	17.7	17.6	17.5	17.4	
27	48.9	48.8	48.8	48.7	48.7	48.6	48.6	48.5		72	17.2	17.1	17.0	16.9	16.8	16.7	16.5	16.4	
28	48.5	48.4	48.4	48.3	48.3	48.2	48.2	48.1		73	16.3	16.2	16.1	16.0	15.8	15.7	15.6	15.5	
29	48.1	48.0	48.0	47.9	47.9	47.8	47.8	47.7		74	15.4	15.3	15.1	15.0	14.9	14.8	14.7	14.6	
30	47.7	47.6	47.6	47.5	47.5	47.4	47.3	47.3		75	14.4	14.3	14.2	14.1	14.0	13.8	13.7	13.6	
31	47.2	47.2	47.1	47.1	47.0	46.9	46.9	46.8		76	13.5	13.4	13.3	13.1	13.0	12.9	12.8	12.7	
32	46.8	46.7	46.7	46.6	46.5	46.5	46.4	46.4		77	12.5	12.4	12.3	12.2	12.1	11.9	11.8	11.7	
33	46.3	46.2	46.2	46.1	46.0	46.0	45.9	45.9		78	11.6	11.5	11.3	11.2	11.1	11.0	10.9	10.7	
34	45.8	45.7	45.7	45.6	45.5	45.5	45.4	45.4		79	10.6	10.5	10.4	10.3	10.1	10.0	9.9	9.8	
35	45.3	45.2	45.2	45.1	45.0	45.0	44.9	44.8		80	9.7	9.5	9.4	9.3	9.2	9.1	8.9	8.8	
36	44.8	44.7	44.6	44.6	44.5	44.4	44.3	44.3		81	8.7	8.6	8.5	8.3	8.2	8.1	8.0	7.9	
37	44.2	44.1	44.1	44.0	43.9	43.9	43.8	43.7		82	7.7	7.6	7.5	7.4	7.2	7.1	7.0	6.9	
38	43.7	43.6	43.5	43.4	43.4	43.3	43.2	43.1		83	6.8	6.6	6.5	6.4	6.3	6.2	6.0	5.9	
39	43.1	43.0	42.9	42.9	42.8	42.7	42.6	42.6		84	5.8	5.7	5.5	5.4	5.3	5.2	5.1	4.9	
40	42.5	42.4	42.3	42.3	42.2	42.1	42.0	42.0		85	4.8	4.7	4.6	4.5	4.3	4.2	4.1	4.0	
41	41.9	41.8	41.7	41.6	41.6	41.5	41.4	41.4		86	3.8	3.7	3.6	3.5	3.4	3.2	3.1	3.0	
42	41.3	41.2	41.1	41.0	40.9	40.9	40.8	40.7		87	2.9	2.7	2.6	2.5	2.4	2.3	2.1	2.0	
43	40.6	40.5	40.5	40.4	40.3	40.2	40.1	40.0		88	1.9	1.8	1.6	1.5	1.4	1.3	1.2	1.0	
44	40.0	39.9	39.8	39.7	39.6	39.6	39.5	39.4		89	0.9	0.8	0.7	0.5	0.4	0.3	0.2	0.1	
45	39.3	39.2	39.1	39.0	39.0	38.9	38.8	38.7											

Add to the observed altitude of the Moon's upper limb, lower limb, or center; and apply also the additional correction from the daily page. The degrees of observed altitude are in the column, and the minutes across the top. If the minutes of observed altitude are between 0'.0 and 8'.0, use the first column of corrections; if between 8'.0 and 15'.0, use the second column; etc. If the minutes are exactly 0'.0, 8'.0, 15'.0, etc., use the right-hand column of the two possible.

For height of eye, and corrections for Sun, planets, and stars, see front cover.

STARS

Numerical Order				Order of SHA				
No.	Name	Mag.	SHA	Dec.	SHA	Dec.	No.	Name
1	Alpheratz	2.2	359	+29	14	+15	57	Markab
2	Ankaa	2.4	354	-42	16	-30	56	Fomalhaut
3	Schedar	2.5	351	+56	29	-47	55	Al Na'ir
4	Diphda	2.2	350	-18	35	+10	54	Enif
5	Achernar	0.6	336	-57	50	+45	53	Deneb
6	Hamal	2.2	329	+23	54	-57	52	Peacock
7	Acamar	3.1	316	-40	63	+ 9	51	Altair
8	Menkar	2.8	315	+ 4	77	-26	50	Nunki
9	Mirfak	1.9	310	+50	81	+39	49	Vega
10	Aldebaran	1.1	292	+16	85	-34	48	Kaus Aust.
11	Rigel	0.3	282	- 8	91	+51	47	Eltanin
12	Capella	0.2	282	+46	97	+13	46	Rasalhague
13	Bellatrix	1.7	279	+ 6	97	-37	45	Shaula
14	Elnath	1.8	279	+29	103	-16	44	Sabik
15	Alnilam	1.8	277	- 1	109	-69	43	Atria
16	Betelgeuse	0.1 to 1.2	272	+ 7	113	-26	42	Antares
17	Canopus	-0.9	264	-53	127	+27	41	Alphecca
18	Sirius	-1.6	259	-17	137	+74	40	Kochab
19	Adhara	-1.6	256	-29	138	-16	39	Zubenelgenubi
20	Procyon	0.5	246	+ 5	141	-61	38	Rigil Kent.
21	Pollux	1.2	244	+28	147	+19	37	Arcturus
22	Avior	1.7	235	-59	149	-36	36	Menkent
23	Suhail	2.2	223	-43	150	-60	35	Hadar
24	Miaplacidus	1.8	222	-70	154	+50	34	Alkaid
25	Alphard	2.2	219	- 8	159	-11	33	Spica
26	Regulus	1.3	209	+12	167	+56	32	Alioth
27	Dubhe	2.0	195	+62	173	-57	31	Gacrux
28	Denebola	2.2	183	+15	174	-65	30	Acrux
29	Gienah	2.8	177	-17	177	-17	29	Gienah
30	Acrux	1.1	174	-63	183	+15	28	Denebola
31	Gacrux	1.6	173	-57	195	+62	27	Dubhe
32	Alioth	1.7	167	+56	209	+ 2	26	Regulus
33	Spica	1.2	159	-11	219	- 3	25	Alphard
34	Alkaid	1.9	154	+50	222	- 1	24	Miaplacidus
35	Hadar	0.9	150	-60	223	-	23	Suhail
36	Menkent	2.3	149	-36	235	-	22	Avior
37	Arcturus	0.2	147	+19	244	+	21	Pollux
38	Rigil Kentaurus	0.1	141	-61	246	+ 5	20	Procyon
39	Zubenelgenubi	2.9	138	-16	256	-29	19	Adhara
40	Kochab	2.2	137	+74	259	-17	18	Sirius
41	Alphecca	2.3	127	+27	264	-53	17	Canopus
42	Antares	1.2	113	-26	272	+ 7	16	Betelgeuse
43	Atria	1.9	109	-69	277	- 1	15	Alnilam
44	Sabik	2.6	103	-16	279	+29	14	Elnath
45	Shaula	1.7	97	-37	279	+ 6	13	Bellatrix
46	Rasalhague	2.1	97	+13	282	+46	12	Capella
47	Eltanin	2.4	91	+51	282	- 8	11	Rigel
48	Kaus Australis	2.0	85	-34	292	+16	10	Aldebaran
49	Vega	0.1	81	+39	310	+50	9	Mirfak
50	Nunki	2.1	77	-26	315	+ 4	8	Menkar
51	Altair	0.9	63	+ 9	316	-40	7	Acamar
52	Peacock	2.1	54	-57	329	+23	6	Hamal
53	Deneb	1.3	50	+45	336	-57	5	Achernar
54	Enif	2.5	35	+10	350	-18	4	Diphda
55	Al Na'ir	2.2	29	-47	351	+56	3	Schedar
56	Fomalhaut	1.3	16	-30	354	-42	2	Ankaa
57	Markab	2.6	14	+15	359	+29	1	Alpheratz